IRON TRADE REVIEW
STEEL
September 11, 1930

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FIRST THE TOOL

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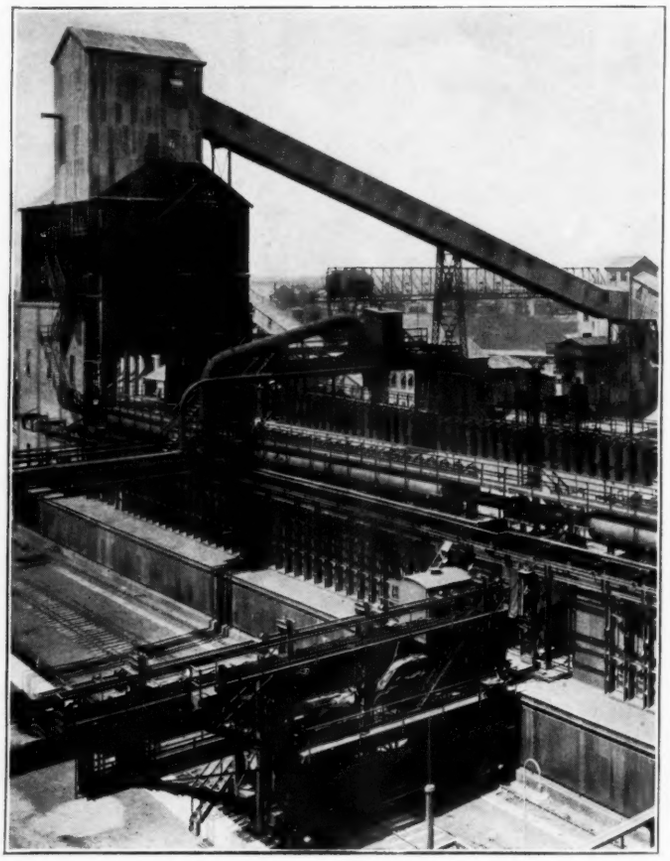

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Vol. 87, No. 11, Sept. 11, 1930, issue of STEEL, published weekly at Cleveland, O. Entered as second class matter at the post office Cleveland, O., under the act of March 3, 1879. Subscription $6 a year in U. S. and Canada; foreign £2:0:0; single copies 25c.

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IRON TRADE REVIEW
STEEL
Published Every Thursday by
PENTON PUBLISHING CO.
PENTON BUILDING, 1213 WEST THIRD ST., CLEVELAND, O.
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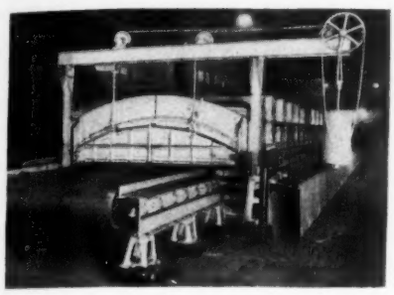

Sheet Maker Installs Modern Heat Treating Furnaces. Page 43.

THIS WEEK:

EIGHTEEN editorial pages, beginning with page 149, *in this issue are devoted to the twelfth National Metal Congress and Exposition, to be held in the Stevens hotel, Chicago, Sept.* 22-26. *Six divisions of four engineering societies will participate in the event, devoted to various phases of steelmaking, fabricating, processing and treating, and welding. The number of exhibitors is* 175, *and this is the first time the exhibition and the technical sessions will be held under one roof, making the arrangements more convenient for exhibitors and guests.*

STEEL is published by the Penton Publishing Co., Cleveland, O. Member, Audit Bureau of Circulations; Associated Business Papers Inc., and National Publishers Association

BRANCH OFFICES:

New York	220 Broadway
Chicago	Peoples Gas building
Pittsburgh	Oliver building
San Francisco	Claus Spreckels building
Washington	National Press building
Cincinnati	Bell block
London	Caxton House, Westminster, S.W.I.
Paris	9 Rue de Londres
Berlin	Dahlmerstrasse 64 A, Lichterfeld-West

Subscription in the United States, Canada, Cuba and Mexico $6 per year; in Great Britain and European countries £2:0:0.

Entered as second class matter at Post Office at Cleveland under the Act of March 3, 1879.

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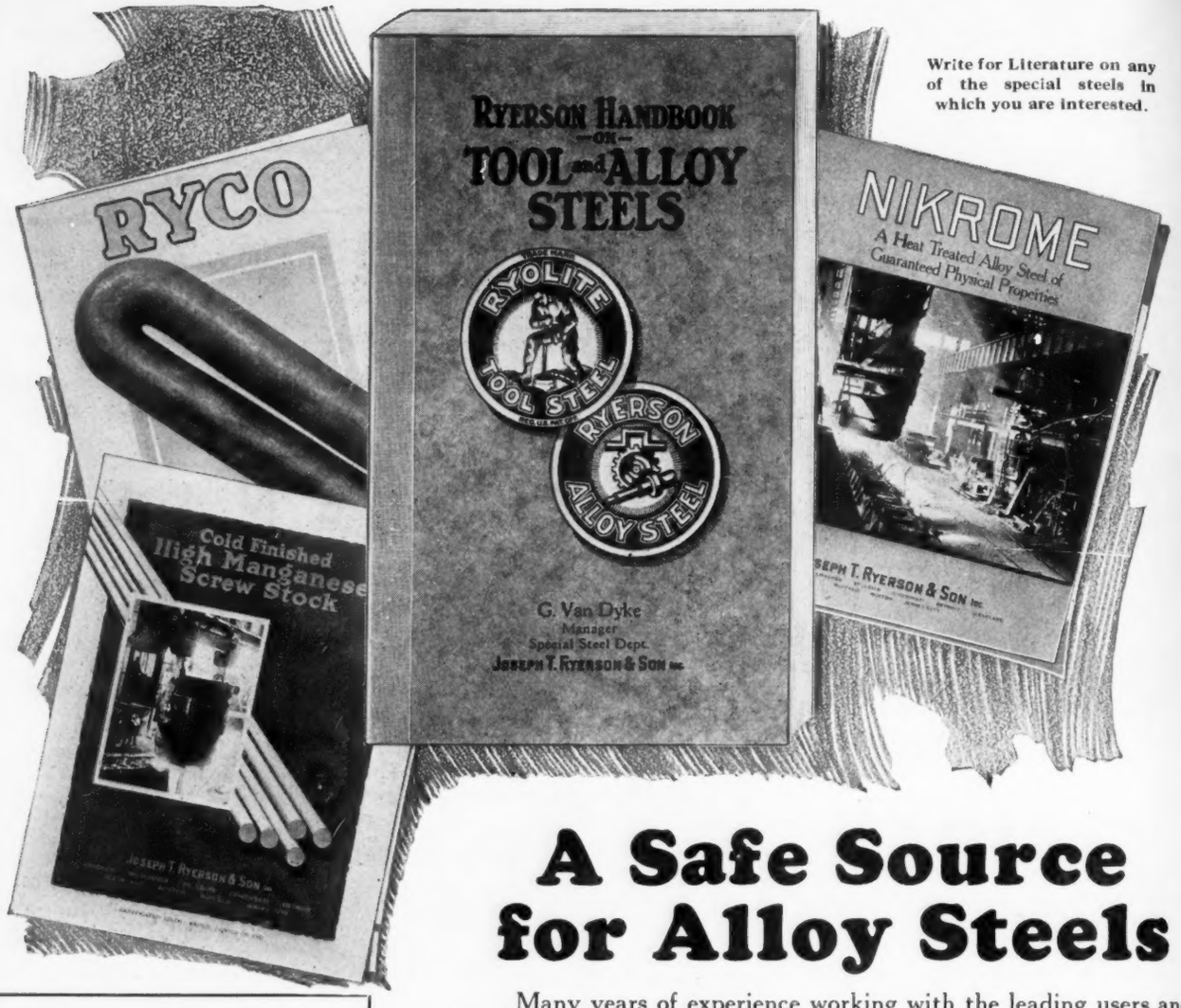

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Volume 87 Number 11

IRON TRADE REVIEW
STEEL

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

STEEL'S confidence of a turn in its fortunes received substantial backing this week in the report of the American Iron and Steel institute (Page 29) that ingot production increased in August. True, the gain over the daily rate of July was modest—about 5.5 per cent; nevertheless, it checked the decline which had run unbridled since February and coincides with the determination of producers to yield no further in the matter of prices. Certainly the market situation in steel has recovered some semblance of firmness; to say strength or virility would be outrunning actual progress. It is significant that all appraisals of the business situation are being voiced in the same conservatively-cheerful key, trade reviews, bank statements, personal forecasts being uniformly turned toward the sunrise. Henry Ford, sailing for Europe, says no wage reductions are necessary to restore normal business. Elisha Lee tells how his Pennsylvania railroad is spending a billion dollars to assure its share of returning prosperity. If steel is genuinely the leader, an improved pig iron situation is inevitable, more coal will be coked, more freight loaded. It is the fashion to be buoyant, yet there is no delusion that the recovery will be precipitate or widespread. The fact that optimism is becoming more intelligent is in itself no mean development.

Steel Ingot Capacity Increased

One of the finer characteristics of steel is its vision to penetrate periods of business depression and apprehend the lush times beyond, materializing this vision in expansion in the so-called off years. Although ingot capacity thus far in 1930 has averaged an operating rate of scarcely 70 per cent, the traditional expansion of capacity is under way. A compilation (Page 23) of new open-hearth and bessemer steel capacity now under way or already completed this year reveals that 1930 will register an increase of approximately 6 per cent in capacity. By the turn of the year the industry will be prepared to turn out 66,195,279 gross tons of ingots, compared with its last official rating of 62,265,270 tons. In record 1929 actual production of open-hearth and bessemer steel was 54,313,845 tons.

Small Producers' Earnings Steadier

In this expansion the energy of the United States Steel Corp., largest individual producer, is greater, relatively, than that of its competitors, reflecting in degree the aggressiveness of this interest in alloy steel and pipe. To some this leadership of the Corporation will be additional proof that in periods of depression large

International News Photo

A market from a window: Only the keenest fabricator could estimate the tonnage of structural steel to be viewed from the observation of the new Chrysler building, in New York, but certainly it would keep every structural shop in the country busy more than a year.

aggregations of capital are better fortified than small ones. However, this deduction is not entirely proved by a comparison of earnings (Page 35) of important steel producers and consumers. Contrasting the first half of 1930 with the first half of 1929 reveals a mixed situation, but there is some warrant for the conclusion that small producers do not soar to such high peaks of earnings in boom times, nor do they sink to such low levels in time of depression. Among consumers of steel it is interesting to note that the manufacturers of railway equipment, on the whole, have done exceedingly well this year.

Equipment Builders Are Alert

Makers of equipment have been alert to the situation, of course, as their financial reports (Page 36) show. They have co-operated with the industry in speeding up the cycle of production and in lowering costs. A Pittsburgh district sheet mill, for example, has installed four breakdown mills, three finishing mills, new cold-rolling equipment, modern furnaces for heating, normalizing and annealing, incorporating the economies of natural gas—all enabling the mill to increase its monthly capacity from 12,000 tons to 16,000 tons (Page 43). . . . To pipe, the steel industry owes much this year from the tonnage standpoint. For manufacturing reasons, large diameter pipe, particularly seamless, is made in short lengths. One disadvantage is the number of field welds involved. Now, a builder of welding equipment has developed an automatic machine which buttwelds electrically two short lengths, handling diameters up to 24 inches, thereby reducing field welding one-half (Page 56). . . . And speaking of welding, resistance brazing is more widely being used for joining metals, being quicker than soldering, making a smaller joint and having better physical properties. By passing a current of electricity through the parts sufficient heat is generated that an alloy of required characteristic melts and flows through the joint section to form a union at a temperature below the melting point of the metals being united (Page 59).

Merger Hearing Nearing the End

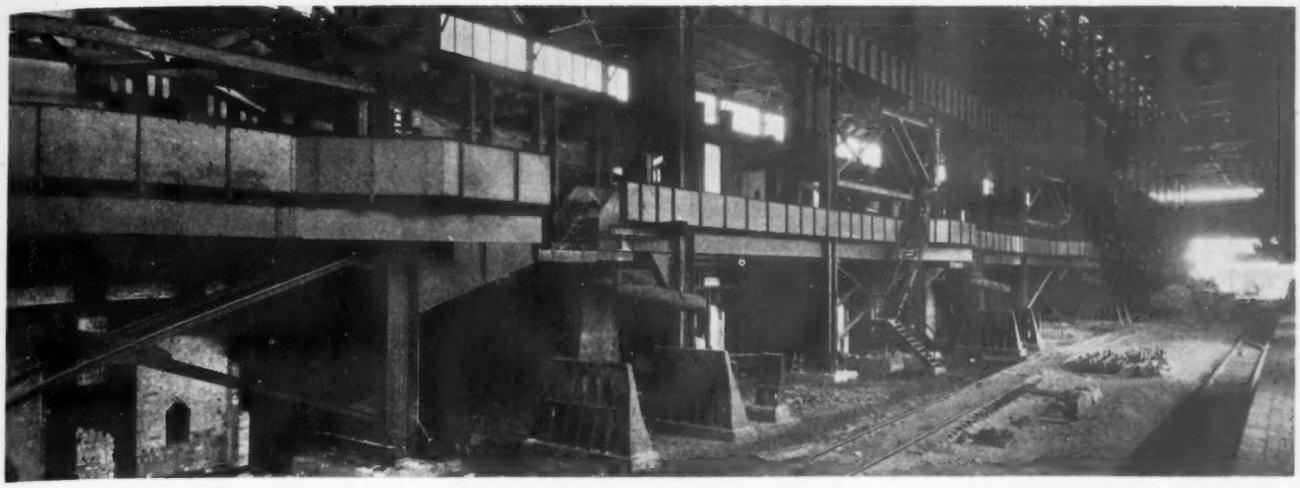
Hearing of the Bethlehem-Sheet & Tube merger case appears to be drawing to a close, with the court barring further "digging" into Bethlehem books by opponents of the merger. Testimony may be completed and arguments begun next week (Page 27). . . . Thomas J. Doherty, tariff counsel for the American Iron and Steel institute, testifies before customs experts at Washington hearing the complaint that Russian manganese ore is "dumped" in the United States. Consumers are vigorously opposing higher duties on the ore (Page 30). . . . Manganese steel castings are used widely where service demands resistance to a combination of abrasion and impact. Several types of the steel find common use and although their uses are fairly well known the mechanism of the changes conferring special properties as a result of heat treatment are not so well known. Some of these mechanisms are discussed (Page 66). . . . Air drills used for cutting away solid rock must be rugged in construction to withstand the severe impacts and shocks to which not only the drill bits but the internal parts of the drill are subjected constantly. Heat treatment has much to do with the life and performance of these drills. A company which makes thousands of air drills each year has developed a manufacturing practice which gives consistent quality of products. Much of the case hardening is done in cyanide baths (Page 48).

Demolishing Obsolete Automobiles

A new system of disposing of obsolete automobiles is being worked out by Cleveland automobile dealers, backed by the National Automobile Chamber of Commerce. Arrangements have been made with a scrapping company to demolish obsolete cars as they are traded in, preventing them from being sold to corner junk dealers who make a business of reselling parts, tending to keep old automobiles "alive." The dealers will receive part of the profits of the scrap sales (Page 24). . . . A survey by the director general of the Institute of Scrap Iron and Steel Inc. indicates scrap prices are due for an advance (Page 28). . . . Split bearings for automobile steering apparatus must resist wear to a high degree, at the same time they must not be brittle as would be the case if hardened completely. To obtain the necessary hardness on the inside and toughness throughout the section localized case hardening is performed. After machining the bearings are copper plated, the plate is removed on the bearing surface and the parts are hardened in a salt bath. This gives long life without endangering the strength of the bearing (Page 69).

Ready for National Metal Congress

The stage is set for the twelfth National Metal congress and National Metal exposition, the first in which the sessions and show are to be held under the same roof. For the third time in twelve years and the second in five, the event will be in Chicago, Sept. 22-26, with the Stevens hotel as headquarters. Six divisions of the American Society for Steel Treating, American Welding society, American Society of Mechanical Engineers and American Institute of Mining and Metallurgical Engineers are participating groups. More than 175 manufacturers will display a wide range of products made or used in the steel and metalworking industry. A number of Chicago district plants will show visitors through plants during the week (Page 149).



Pouring floor in new open-hearth steel unit, Great Lakes Steel Corp., Detroit

1930 Open-Hearth Increase Led by Corporation

FORTY-FOUR open-hearth furnaces with a steelmaking capacity of 3,930,000 gross tons yearly, adding 6 per cent to 1929's capacity, are now under construction at American steelworks. As in the past, an uncertain market has been made the period of steelworks' capacity enlargement to care for demands of the future.

The country's 62,265,270-ton yearly open-hearth and bessemer ingot capacity will soon be swelled to 66,195,270 tons, according to plans in progress and formulated for the year, with the exception of an open-hearth expansion program by National Tube Co. in the Pittsburgh district, plans for which are as yet withheld.

Illinois Steel Co., subsidiary of United States Steel Corp., is carrying forth extensive plans for steel producing expansion at its South Chicago and Gary works in the Chicago district. Added to the 45 basic open hearths at Gary will be seven new ones, each of capacity of 150 tons.

The 27 furnaces at the Illinois company's South Chicago division will be swelled in number with an additional 14, each also of 150 ton size. These 21 furnaces can pour approximately 1,800,000 tons of steel yearly, beside the Corporation's rated capacity existing of 6,720,000 tons in this district.

National Tube Co., at Pittsburgh, another Steel corporation unit, has plans to add basic open hearths to capacity which was formerly bessemer. American Steel & Wire Co., also a Steel corporation subsidiary, will not add further capacity immediately to its seven open-hearth furnaces at Newburgh works, Cleveland, as former plans were intended.

Bethlehem Steel Co., Bethlehem, Pa., second largest steel producer, is

How Producers Rank in Steel Ingot Capacity in 1930

(Including steel producers, annual capacity 100,000 tons ingots or more)
(In gross tons)

United States Steel Corp.		*26,409,400
Carnegie Steel Co.	9,871,400	
Illinois Steel Co.	9,086,000	
National Tube Co.	2,204,000	
Tennessee Coal, Iron & Railroad Co.	1,752,000	
American Steel & Wire Co.	1,617,000	
Minnesota Steel Co.	540,000	
Columbia Steel Co.	363,000	
American Sheet & Tin Plate Co.	336,000	
American Bridge Co.	240,000	
Bethlehem Steel Co.		9,810,000
Republic Steel Corp.		4,806,000
Republic Iron & Steel Co.	2,196,000	
Central Alloy Steel Co. and Interstate Iron & Steel Co.	1,700,000	
Donner Steel Co.	560,000	
Bourne-Fuller Co.	350,000	
Jones & Laughlin Steel Corp.		3,420,000
Youngstown Sheet & Tube Co.		3,240,000
Inland Steel Co.		2,000,000
American Rolling Mill Co.	1,666,705	1,876,705
Sheffield Steel Corp.	210,000	
National Steel Corp.		1,850,000
Weirton Steel Co.	1,250,000	
Great Lakes Steel Corp.	600,000	
Wheeling Steel Corp.		1,614,640
Corrigan, McKinney Steel Co.		1,140,000
Otis Steel Co.		990,000
International Harvester Co. (Wisconsin Steel Co. works)		922,000
Colorado Fuel & Iron Co.		898,000
Pittsburgh Steel Co.		720,000
Lukens Steel Co.		686,500
Pittsburgh Crucible Steel Co.		660,000
Alan Wood Steel Co.		600,000
Ford Motor Co.		519,350
Granite City Steel Co.		360,000
Worth Steel Co.		360,000
Andrews Steel Co.		360,000
Baldwin Locomotive Works		345,000
Standard Steel Works Co.	145,000	
Midvale Co.	200,000	
Sharon Steel Hoop Co.		338,000
Allegheny Steel Co.		338,000
Empire Steel Corp.		330,000
Gulf States Steel Co.		280,000
Continental Steel Corp.		250,000
Central Iron & Steel Co.		250,000
John A. Roebling's Sons Co.		231,025
Laclede Steel Co.		225,000
Phoenix Iron Co.		223,800
Follansbee Bros. Co.		200,000
Keystone Steel & Wire Co.		180,000
Wickwire - Spencer Steel Corp.		175,000
Stanley Works		120,000
Scullin Steel Co.		115,000
Atlantic Steel Co.		100,000

*Exclusive of National Tube Co. 1930 expansion.

also convinced that the use of steel is steadily widening, evidencing its policy in caring for future production needs by adding 12 open hearths now, six at Sparrows Point, Md., and another six at its Lackawanna unit, Buffalo. By this construction, 1,200,000 tons of potential ingot capacity will be added.

Entry of a new steel producer into the field recently was marked with the pouring of steel, Aug. 23, by the Great Lakes Steel Corp. at Ecorse, Mich., subsidiary of National Steel Corp., Pittsburgh. Six open hearths, capacity 150 tons each, are in a completed stage and about 600,000 tons yearly maximum capacity will be inaugurated.

Wisconsin Steel Co., Chicago, subsidiary of International Harvester Co., adds two 100-ton open hearths to its existing seven basic steelmaking furnaces and augments yearly capacity 190,000 tons. Corrigan, McKinney Steel Co., Cleveland, with enlargement of its 14 furnaces, has stepped up its potential content to 1,140,000 tons from the 1929 annual mark of 1,000,000 tons.

Low on Airplane Carrier

New York—Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is low bidder for constructing a navy airplane carrier, requiring 10,000 tons of steel. Its bid was $15,560,000.

Only Ruins at Sligo, Once Charcoal Iron Center

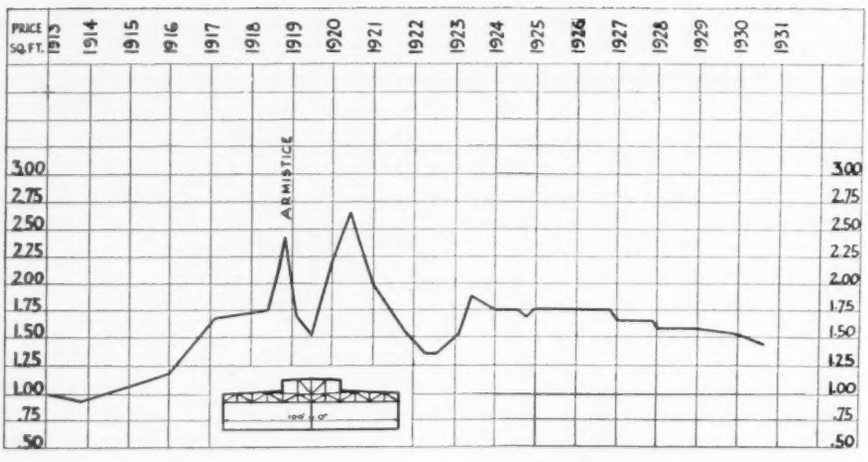
Fifty years after establishment of a charcoal blast furnace stack at Sligo, Dent county, Missouri, in the Ozarks, nothing but a few ruins remain. Dismantling of the Sligo & Eastern railroad, now in progress, will remove the last trace of the activity that once made this an industrial center. Eight years ago the last charcoal iron was produced from the stack, after 42 years of activity, though none of its competitors survived more than 20 years. Edward F. Goltra, long a power in efforts to produce pig iron in Missouri, founded the company in 1880 and developed a large enterprise, including charcoal ovens and a railroad. A chemical laboratory was also established. In 1901 Sligo passed into the possession of the American Car & Foundry Co. and it is these owners who are dismantling the small remainder of the plant.

Part of ruins at Sligo Furnace Co. site in the Ozarks

About a third of the ore used in the stack was mined locally and the remainder was shipped from northern Michigan. Timber from the surrounding hills furnished charcoal and sufficient water for cooling was obtained from a river at the foot of the mountain.

It was a brave effort which could not succeed because conditions of the iron and steel industry dictated other locations for successful production of pig iron.

Industrial Building Costs Low



Copyright, The Austin Co.

INDUSTRIAL building costs are the lowest in eight years, according to a survey by the Austin Co., engineers and builders, Cleveland. Except for a period in 1922, costs have not been so low since 1916.

All the decline is due largely to falling prices of materials and greater efficiency of labor and construction equipment. Wage rates at 185 per cent over the 1913 level continue at the peak for all time, while all building costs, including labor, are less than 40 per cent over the 1913 level.

A modern factory building, 100 feet wide and 200 feet long of steel and concrete construction can be erected in the average midwestern city for $1.40 a square foot against $1.87 in 1923, a high mark of $2.65 in 1920 and $1 in 1913 The chart shows comparative prices of a building 100 x 200 feet. The decline in costs is resulting in a marked increase in inquiries from manufacturers contemplating new construction.

Eastern Sand Producers Ask Rate Adjustment

Five producers of foundry sand in the New Jersey and Albany districts will ask the interstate commerce commission at the industrial sand cases hearings, to start at Washington Sept. 9, to grant a better basis of freight rates to points in New England and the seaboard states. It is claimed present rates work a hardship on foundries and manufacturers on the Atlantic seaboard which are in competition with western manufacturers. The five eastern sand producers are New Jersey Silica Sand Co., Millville, N. J.; George F. Pettinos, Philadelphia; Paxson-Taggart Inc., Philadelphia; Whitehead Bros. New York; and Albany Sand & Supply Co., Albany, N. Y. They will be represented by Charles E. Vose, 80 Federal street, Boston.

Pittsburgh Firm To Design Two Russian Steelworks

Pittsburgh—S. R. Smythe Co. Inc., Pittsburgh, has been awarded the contract to design two open-hearth steel plants on the Dneiper river in Russia for the Dneprostal Metallurgical Works of Russia. One plant will consist of nine 250-ton stationary furnaces and the other of six 250-ton tilting furnaces. One plant will also have six 1000-ton blast furnaces and finishing capacity for 1,000,000 tons of hot-rolled products. The other will make alloy and tool steels principally.

Elgin, Joliet & Eastern Asks Dismissal of Suit

Chicago—A motion to dismiss the suit of the United States government against the Elgin, Joliet & Eastern railroad has been filed in federal court here by Knapp, Beye, Allen Cochran & Cushing, attorneys, for the railroad.

The government seeks a writ of

mandamus to compel the road to cease transporting in interstate commerce products of subsidiaries of the United States Steel Corp., which owns the capital stock of the Elgin, Joliet & Eastern railroad, claiming that is a violation of the commodities clause, interstate commerce act.

The motion to dismiss is based upon the grounds that the government's petition does not state a cause for an action in mandamus, and it sets forth also that as mandamus is an action in equity, the suit should have been filed in a court of equity.

Since the courts have been on vacation, no time is to be set at present for action on the motion just filed.

Would Restore Iron Rate

Washington — A complaint has been filed with the interstate commerce commission by Alan Wood Steel Co., Conshohocken, Pa., against

Henry Miller Photo

Thomas Walker Page

Widely known economist, who served as member of tariff commissions under Presidents Taft, Wilson and Harding, returns as a member, appointed by President Hoover

the Alabama Great Southern railroad.

The complaint is against rates on pig iron between points in the Middle Atlantic and New England states and points in Alabama and Tennessee. It asks for establishment of just and reasonable rates not less than those applicable on and prior to June 1, 1929, and in lieu of rates not published under agent Speiden's I.C.C. No. 1333.

McNally-Tollefson Foundry Co., Stoughton, Wis., has filed bankruptcy proceedings, admitting liabilities of $12,398 and assets of $3921. Unsecured claims total $11,700.

Hoover Making New Tariff Board Unusually Strong

HAVING appointed Henry P. Fletcher, former member of the diplomatic corps, chairman of the new tariff commission, and Thomas W. Page, chairman of the old commission during the Wilson and in the early days of the Harding administration, President Hoover has four members still to appoint and until Sept. 17 to do it.

From the caliber of the first two appointments, it is evident that the President intends making the new tariff commission an exceptionally strong body. On the subject of the tariff the administration is receiving much criticism, and an issue for the next presidential election has been created. It seems probable that the personnel of the commission and its program,especially in regard to the flexible provisions, will be determined with an eye to easing this situation.

Political Washington expects the President to reappoint Alfred P. Dennis and Lincoln Dixon, members of the old commission, and to seek two entirely new members to round out the board. Dr. Julius Klein, assistant secretary of commerce, undoubtedly could have been on the commission, but is understood to have preferred his present post.

Amendment May Be Handicap

The commission is facing a number of serious questions, one of which includes personnel. An amendment was slipped into the tariff bill while in the making which looked innocent enough but which may develop into a serious handicap for the commission.

It is paragraph 340, which provides that the commission shall, within a period of two years, determine equal and valorem rates in American value instead of in foreign value as shown in the present tariff law.

Experts of the commision insist that this report will take all of the present personnel of the commission two years to compile. Should this be true and be carried out, it will mean that either the commission will have to get more money and expand or else it will have to let all of its other investigations go until that job is completed. The joke of the matter is, that when the senate gets this information it does not plan to do anything with it at the time.

The commission now has on its docket 35 investigations, most of which were asked by the senate before adjournment. Under the heading of metals, the investigations include pig iron, paragraph 301; woven wire fencing and netting, paragraph 317; fourdrinier wires, woven cloth and cylinder wires, paragraph 318; bells, paragraphs 364, 397, and 1541; and 11 articles of agricultural hand tools, paragraph 373. The pig iron, wire netting and hand tool investigations were ordered at the request of the senate.

Up to this time the commission has not actually ordered the making of any investigations except those requested by the senate. As a matter of fact, none of the investigation is now going forward as officials of the commission wish to wait until the permanent commission is appointed and has formulated its own policies. This means that none of the field work investigations will get under way until after Sept. 17.

Henry Miller Photo

Henry P. Fletcher

Veteran diplomat appointed chairman of reorganized tariff commission. He served as ambassador to Chile, Mexico, Belgium and Italy, and as undersecretary of state

Denies Sharon to U. S. Steel

Youngstown, O.—Severn P. Ker, president of the Sharon Steel Hoop Co., has officially denied reports that the company was about to be absorbed by the United States Steel Corp.

Automotive Scrapping Plan To Increase Tonnage

SPONSORS of the so-called Cleveland plan for scrapping obsolete automobiles say it will not have a disturbing effect on the scrap market, though it be generally adopted throughout the country. More yards will be established, a large tonnage that now goes to waste will be offered in the market; but how many, and how much is uncertain as the plan still is in an experimental stage.

A radical change in the disposal of worn-out cars that come into possession of dealers is contemplated. Directors of the National Automobile Chamber of Commerce have issued a circular letter to the dealers urging them to adopt the Cleveland plan, and it has strong support directly from some of the leading manufacturers, though the Ford Motor Co. has its own system for scrapping cars, and is not interested, except as an observer.

The plan provides for the complete demolition of old machines; thus tending to maintain demand for new cars and new parts. The economic benefits resulting therefrom, its sponsors claim, will far outweigh any disadvantage which may result from the destruction of parts which might still be used. The removal of old automobiles and decrepit machines "doctored up" with second-hand parts is stressed as an important influence for safety, as 15 per cent of all traffic fatalities are ascribed to the use of obsolete and defective cars.

The plan will best be understood by a brief description of its operation in Cleveland. Interests identified with the A. Shaw Co., scrap dealer, have organized a holding company, the National Guarantee Auto Scrapping Co., to form local units wherever practical. The first unit, known as the Cleveland Guarantee Auto Scrapping Co., has been organized in co-operation with the Cleveland Automobile Manufacturers and Dealers association.

Directors Determine Policies

The Shaw interests manage and operate the scrap plant, but policies are determined and dealers' interests are protected by three directors elected by the dealers' association. This company serves 28 counties in northern Ohio and western Pennsylvania within a radius of 100 miles of Cleveland. It pays the dealer 25 cents per 100 pounds, full weight of the car, less $1 if it lacks a battery, and less 25 cents for each missing tire. For each car it takes in it places $1 in a fund, and at the end of the year it also pays into this fund 25 per cent of the net profits of the company, after deducting 6 per cent on actual capital invested. All of this fund then is distributed to the participating dealers on a pro rata car basis. Dealers, however, must pay cost of hauling cars to the scrap yard, averaging $3 to $4 for a 30-mile trip, under a regular collection system.

The dealer makes no investment in the enterprise; he determines when a car is to be scrapped, merely giving the company the exclusive right to all that he does decide to scrap. When a car is demolished he receives a "certificate of demolition," acceptable to automobile manufacturers who pay a bounty to dealers for all cars removed from service. Some of the manufacturers now have crews going about the country smashing machines on which dealers want bounties; this expense is eliminated.

Systems somewhat similar to the Cleveland plan have been tried and have only partially succeeded if at all. A distinctive feature is that the dealer assumes no risk, takes no active part in the scrap business, but is to share in the profits of its operation.

The number of yards making a business exclusively of buying "junkers" from owners and dealers and selling the usable parts is estimated as 10,000. Of the 2,500,000 to 3,000,000 cars going out of service every year, it is estimated only 25 per cent now end in dealers' hands. The Cleveland plan contemplates protecting dealers from repeated trading-in of the same used car. While the trade-in value was still much higher than its junk-yard price it would be demolished, and never get to the junk dealer. Effective operation would result in the gradual elimination of the majority of the second-hand parts sellers.

Plan Will Save About 3 Per Cent

The Cleveland plan is now in active operation. Practically all the material is salvaged, and outlets have been established. If generally applied throughout the country, its sponsors believe, it will result in an annual saving of about 800,000 tons of automotive scrap which now goes to waste, which is less than 3 per cent of the 30,000,000 tons of scrap produced from all sources. In time the National company contemplates employing metallurgists to work out the best methods of handling the special steels and alloys taken from old cars.

Shearing fender stock at the yards of the Cleveland Guarantee Auto Scrapping Co., a co-operative enterprise of automobile dealers and scrap merchants. A "destruction line" for fast demolition of cars is being installed. No part of an automobile will be salvaged, while practically everything will be reclaimed for sale as material

Rail Heads Oppose Class Rate Decision

Eastern railroads have filed petition with the interstate commerce commission asking for a modification of the eastern class rate decision, issued July 8, 1930.

The carriers' action comes in effective denial to widespread opinion that they would gain important increases in revenue as a result of the

decision, which prescribes readjustment of class rates in the area north of the Ohio and east of the Mississippi rivers.

The commerce commisison report included increases in first to fourth class rates, reductions in fifth and sixth class rates, and eliminated class rate differential system to and from North Atlantic ports on domestic traffic.

However, railroad executives do not interpret this action as a rate advance which would increase revenues of eastern carriers, adding that "the present porposal will greatly decrease the carriers' revenues on class rate and related traffic." Transportation conditions have changed, they assert, from the selected days of 1925 when the commerce investigation was decided on.

The petition of the railroads also claims that the commission has excluded the most important of all class traffic, iron and steel in carloads, from the class rates prescribed.

Eastern Steel Creditors Await Master's Report

Creditors of the Eastern Steel Co., Pottsville, Pa., now in receivership, believe the company has done well in view of the depressed condition of the steel markets. No date has been set for the filing of the master's report on hearings in the receivership case.

At a creditors' meeting Aug. 20, Archibald T. Johnson, lawyer, Philadelphia, was appointed by the court as special master.

Eastern Steel Co., marketing structural shapes through the East and South, has been in the hands of the receiver since Jan. 8, 1926, during which time gross sales amounted to over $15,000,000 but net earnings for the period totaling only $260,684. Creditors of the company were given four alternatives in April by Edward L. Herndon, receiver, embracing choice of auction, postpone sale, reorganize financially, or extend payments due creditors over a period of five or ten years.

Starts Galvanizing Plant

Steel Co. of Canada, Montreal, Que., has started operation of its new galvanizing plant at Hamilton, Ont. One unit is in use, with capacity for 50 tons daily of 54-inch plate. A second unit of similar capacity is nearly ready. A smaller machine of 34 tons capacity is nearing completion. Other unit of similar capacity is nearly ready. Other additions to equipment include two open-hearth furnaces, a 10-inch and 12-inch merchant mill, cleaning and distributing system for blast furnace gas, a central pupming station, new ore dock and minor improvements.

Merger Hearing Nearing End; Court Stops Further "Digging"

HEARING of the suit in Youngstown, O., to enjoin the Bethlehem-Sheet & Tube merger, now in its eleventh week, is drawing to a close. Next Monday or Tuesday may see the end of testimony and the beginning of arguments. A ruling by Judge David G. Jenkins Tuesday is believed to have shortened the trial materially. Counsel for Bethlehem Steel Corp. introduced Monday a statistical table in proof of a technical point concerning Bethlehem's auditing methods.

Lawyers for the merger opponents immediately seized on it as an opening for further examination of Bethlehem books, and Judge Jenkins temporarily ruled in favor of a limited inspection. Bethlehem counsel then withdrew the exhibit and resubmitted it Tuesday, when after further argument, Judge Jenkins by a ruling shut out examination of books by merger opponents. W. B. Campbell, an auditor for Price, Waterhouse & Co., testified most of the day on details of the Cleveland and New York meetings, previously narrated by other witnesses.

The principal witnesses last week were S. Livingston Mather, Harris Creech and William C. Reilly. Mr. Mather and Mr. Creech came in at the request of Judge Jenkins who expressed a desire for all the facts surrounding the Sheet & Tube directors' meetings at which the merger was discused. Mr. Mather is a director in Sheet & Tube, representing the holdings of the Cliffs Corp., which owns 125,000 shares in Sheet & Tube. Half of the Cliffs Corp. is owned by Cleveland-Cliffs Iron Co. interests, headed by William G. Mather, and the other half is owned by Cyrus S. Eaton, merber opponent. S. Livingston Mather is a son of Samuel Mather, head of Pickands, Mather & Co., and is a nephew and business associate of W. G. Mather.

Mr. Mather said he first heard of the merger proposal March 7, the day he returned from the South where he had gone with Mr. Eaton. Mr. Eaton also heard the merger news on March 7 from H. G. Dalton at a meeting in W. G. Mather's office in Cleveland. The witness said Mr. Eaton immediately criticized the proposal, and continued his criticism more strongly at another meeting March 11 in Pickands, Mather & Co.'s office.

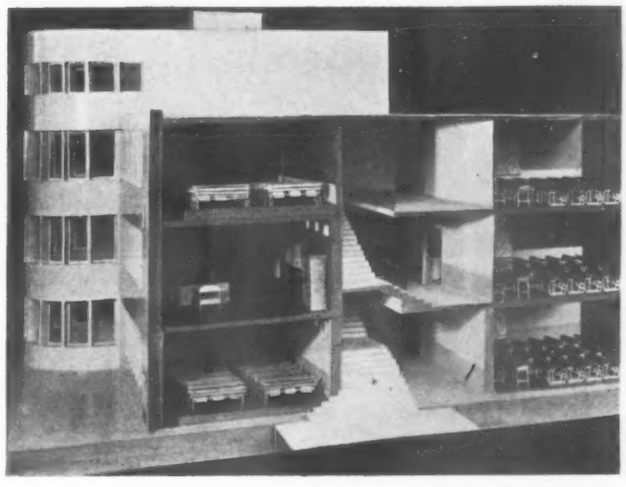
Mather Explains His Stand

Mr. Mather said he took no part in the discussion March 7 but after the meeting he talked with his father and Mr. Dalton with respect to postponing the directors' meeting set for March 10 until further facts could be obtained. He then described fully the meeting of March 11. He stated Mr. Eaton postponed but did not refuse outright to examine the figures submitted by Price, Waterhouse & Co.

The witness said he did not vote at the Sheet & Tube directors' meeting March 12, called to consider the merger proposal. This was because he represented the divided Cliffs Corp. interest, and he had no instructions as to how to vote. However, at the stockholders' meeting April 8, the

Model School House Made of Steel

GERMANS are constantly striving to extend uses of steel. Here is a complete model of a new type of school and equipment made entirely of steel. It is not a toy, but a practical means for visualizing and studying details involved in a standard all-steel school house



Henry Miller Photo

witness said he voted his personal stock of 5000 to 6000 shares in favor of the merger. This was because his father had given him the stock and his father favored the merger.

Harris Creech, president, Cleveland Trust Co., testified he was a director in Sheet & Tube during March and April of this year, but was not re-elected at the annual meeting in April. He became a director on the invitation of A. E. Adams, Youngstown banker, to replace Harry Coulby, deceased. Mr. Adams wanted some one on the board who was friendly to Mr. Eaton, a large stockholder, and Mr. Eaton was a director of the Cleveland Trust Co.

"I stated to the board," said Mr. Creech, "that as there was a controversy here and I was elected to the board with Mr. Eaton's approval, that Mr. Eaton was opposed to this merger and he had no one on the board to express his views, and that I thought he should have a voice; therefore I was not going to express any personal views but I was going to vote against the merger; and I did. It was a pretty difficult thing to digest this whole matter in the one day given me to do it."

William C. Reilly, vice president of Sheet & Tube company in charge of operations, said he has been associated with the company ever since it was organized in 1900, being its first auditor. He stated he "always had favored merging with Bethlehem," although he also had favored a merger with Inland Steel Co., because Sheet & Tube needed a connection with concerns making a greater diversity of products. He considered Bethlehem's plants favorably situated as to sources of raw materials such as ore, coal and limestone; also as to getting to the large markets of the East, South and Northwest with their heavier steel materials such as shapes and rails. These would supplement the lighter products of Sheet & Tube.

Scrap Institute Survey Indicates Stage Set for Higher Prices

PRICES for steel and iron scrap in all markets have reached bottom and all factors in the industry indicate that markets are set for a rise, according to results of a survey of the principal scrap markets made by Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel Inc., New York. The report covered 11 markets in Pittsburgh, Youngstown, Cleveland, Detroit, Buffalo, Chicago, St. Louis, Philadelphia, New York, Boston and Cincinnati.

The small stock of scrap in dealers' yards and comparatively low inventories of steel mills have served to keep markets firm during the past few weeks and will contribute stability in the near future, the report indicated. There is a comparative shortage of the heavier and better grades, it is claimed, because of the low rate of operations in the principal industries which are producers of scrap in their processes of fabricating steel products. The inflow of country scrap, which constitutes a principal source of supply, has been at the lowest point in many years, because present prices do not warrant its collection.

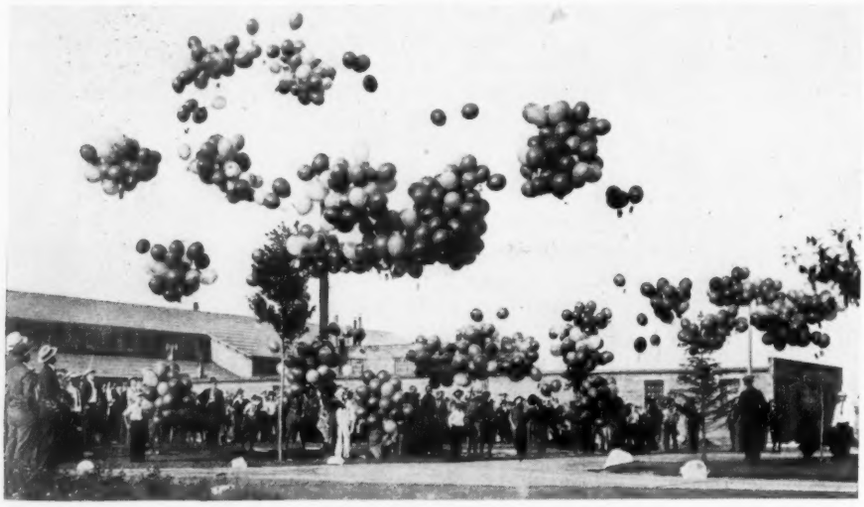
Export of scrap, which is becoming an increasingly important factor, continues the largest single item of iron and steel exports from the United States. Although a record of over 550,000 tons of scrap exports was made in 1929, total exports of this commodity for first half of 1930 indicated the record of 1929 may be equalled.

Production Below Normal

Scrap produced by industries is practically at a standstill in one district and in two markets which normally are large producers, the percentage is about 25 per cent normal. In some districts, country scrap is 5 per cent of normal. It is indicated that at the present market prices it is difficult for itinerant gatherers of scrap collecting several millions of tons annually, to make wages with cart or truck.

Supplies of scrap in dealers' yards are low not only because of the low rate of industrial operation and restricted flow of country scrap, but because during the past year scrap operators have continuously manufactured and marketed their scrap. Price fluctuations during the past year have been narrow, not warranting most dealers to store their scrap. In one district, it is reported that is not more than 15,000 tons in yards, against 100,000 tons during frequent periods in the last ten years.

With the exception of a few large steel companies, the survey shows no large inventories of scrap among consumers. In many cases, consumers have an average of 30 to 45 days' supply on hand, equivalent to a normal protective backlog. In one district, mills are in favorable position with reference to their scrap supply, because most have taken advantage of the low market and accumulated appreciable tonnages. In this market, several mills have purchased scrap during this period at the lowest prices in ten years.



AERIAL MESSENGERS SERVE DOUBLE SAFETY PURPOSE

When the Duluth plant of the Universal Atlas Cement Co., subsidiary of the United States Steel Corp., won the intercompany safety trophy 955 gaily colored balloons were released, as part of the celebration. Each balloon represented a consecutive no-accident day, and they were released by 32 boy scouts, each scout representing one moneth of the mill's consecutive no-accident months. Each balloon carried a tag bearing a brief safety message, a safety crusader badge, and a reproduction of a safety poster. Prizes were offered for finders of those balloons traveling farthest from the plant

Welded Pipe Mill Is Ready

Youngstown, O.—Republic Steel Corp. has completed installation of equipment of the third unit of its electric welding pipe mill, thereby rounding out its $10,000,000 development started last year. Including the new unit, the electric pipe department has sufficient tonnage booked to carry through late fall.

August Ingot Rate Gains 5.5 Per Cent Over July

STEEL ingot production in August increased 5.5 per cent over July. It was the first gain in daily tonnage since February. The daily average output of all companies reporting to the American Iron and Steel institute was 119,050 tons, compared with 112,823 tons in July.

Total output for August was 3,095,293 tons, against 2,933,399 tons in July, the number of working days in each month being 26. Total monthly output has been declining steadily since March.

Production of open-hearth and bessemer ingots for the first eight months this year amounted to 29,821,891 tons, compared with 38,825,943 tons in the comparable period of 1929. The daily average output so far this year has been 144,067 tons, a reduction of 32 per cent from the daily rate of 186,663 tons in the first eight months last year. The daily rate of operations this year has averaged 71.96, against 95.18 in the first eight months of 1929.

The average daily rate thus far indicates a total output this year of 44,804,837 tons, compared with the record production of 54,313,845 tons in 1929.

Freight Rates on Pig Iron from Everett Revised

Boston—Railroad freight rates on pig iron from the furnace at Everett, Mass., to New England points have been revised, increases and decreases being about equally matched. Following is a comparison of typical rates, in dollars per gross ton:

Destination	New Rate	Old Rate
Athol, Mass.	$2.25	$2.27
Bath, Me.	2.85	3.30
Berlin, N. H.	3.05	3.02
Concord, N. H.	2.05	2.02
Fitchburg, Mass.	1.85	1.89
Holyoke, Mass.	2.45	2.27
Laconia, N. H.	2.45	2.27
Montpelier, Vt.	3.25	2.90
New London, Conn.	*	2.55
Norwich, Conn.	*	2.50
Portland, Me.	2.45	2.39
Springfield, Mass.	2.45	2.27
Waterville, Me.	3.05	4.00
Westfield, Mass.	2.45	2.65
Worcester, Mass.	1.85	1.89

*$2.45 plus $5 for car

Locomotive Shipments Gain

Shipments of locomotives totaled 77 in August, compared with 56 in July and 129 in August, 1929. Eight months of 1930 show total shipments at 552 units, in advance of the 517 over the same period of 1929, according to the department of commerce report as follows:

1929	Shipments Domestic	Shipments Foreign	Unfilled Orders Domestic	Unfilled Orders Foreign
Aug.	123	6	405	31
(8 mos.)	445	72	.....	.....
Sept.	67	8	402	27
Oct.	96	.....	396	27
Nov.	75	20	389	9
Dec.	63	4	483	7
(year)	746	104	.....	.....
1930				
Jan.	48	.....	577	10
Feb.	64	3	525	8
March	66	2	529	6
April	94	3	461	3
May	56	2	410	9
June	80	1	335	8
July	55	1	284	7
Aug.	73	4	229	5
(8 mos.)	536	16	.....	.....

Coal Output Is Higher

Production of bituminous coal was estimated at 9,056,000 net tons for the week ended Aug. 30. This compares with 8,494,000 for the prior week. The 1930 total to date of 301,012,000 tons contrasts with 291,956,000 in the corresponding period of 1929.

Galvanized Ware Low

Though shipments of pails and tubs rose in July, production showed the same level as the lowered mark set in June. Figures are below July, 1929; likewise is this true of seven-month aggregates for 1930, shown by the department of commerce:

(In dozens)

1929	Pails and Tubs Production	Pails and Tubs Shipments	Other Ware Production
July	105,454	109,841	42,384
(7 mos.)	1,059,465	1,084,900	330,186
Aug.	107,004	108,461	53,250
Sept.	113,698	120,297	46,594
Oct.	129,282	135,197	45,117
Nov.	102,400	90,684	32,951
Dec.	112,962	107,733	33,114
Total year	1,624,811	1,647,272	541,212
1930			
Jan.	145,588	154,731	33,982
Feb.	119,739	129,853	35,121
March	135,178	135,602	37,963
April	131,015	120,552	44,058
May	113,645	107,496	44,405
June	89,932	82,956	40,646
July	91,870	104,096	42,056
(7 mos.)	826,967	835,286	278,231

Steel Ingot Production—1929-30

94.27 Per Cent of Industry Reporting
Gross Tons

1929	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	Number of working days	Approximate daily output all companies	Per cent of operation
Jan.	3,692,062	549,616	4,241,678	4,500,209	27	166,674	84.99
Feb.	3,590,826	489,279	4,080,105	4,328,789	24	180,366	91.97
Mar.	4,180,408	596,691	4,777,099	5,068,265	26	194,933	99.40
Apr.	4,025,409	640,351	4,665,760	4,950,139	26	190,390	97.08
May	4,275,161	707,484	4,982,645	5,286,339	27	195,790	99.84
June	3,999,363	622,585	4,621,948	4,903,657	25	196,146	100.02
July	3,922,053	649,950	4,572,003	4,850,668	26	186,564	95.13
Aug.	3,987,400	668,023	4,655,423	4,939,172	27	182,932	93.28
8 mos.	31,672,682	4,923,398	36,596,080	38,825,943	208	186,663	95.18
Sept.	3,624,954	642,886	4,267,840	4,527,966	25	181,119	92.35
Oct.	3,631,674	642,235	4,273,909	4,534,405	27	167,941	85.64
Nov.	2,796,214	522,672	3,318,886	3,521,173	26	135,430	69.06
Dec.	2,375,797	360,489	2,736,286	2,903,063	25	116,123	59.21
Total	44,101,321	7,092,261	51,193,582	54,313,845	311	174,643	89.05
1930							
Jan.	3,137,002	441,572	3,578,574	3,796,090	27	140,596	70.22
Feb.	3,336,021	508,618	3,844,639	4,078,327	24	169,930	84.88
Mar.	3,513,904	539,616	4,053,520	4,299,905	26	165,381	82.60
Apr.	3,406,610	509,234	3,915,844	4,153,860	26	159,764	79.80
May	3,265,190	528,968	3,794,158	4,024,778	27	149,066	74.45
June	2,835,527	407,586	3,243,113	3,440,239	25	137,610	68.73
July	2,411,592	353,723	2,765,315	2,933,399	26	112,823	56.35
Aug.	2,543,466	374,467	2,917,933	3,095,293	26	119,050	59.46
8 mos.	24,449,312	3,663,784	28,113,096	29,821,891	207	144,067	71.96

Figures exclude crucible and electric ingots. Operating percentages for 1929 are based on capacity of 60,990,810 gross tons as of Dec. 31, 1928; for 1930 on capacity of 62,265,670 tons as of Dec. 31, 1929.

Brands Manganese Dumping Economic Impossibility

IN A HEARING held Sept. 9 at Washington before Seymour Lowman, assistant secretary of the treasury and his experts, Thomas J. Doherty, tariff counsel for the American Iron and Steel institute, New York, testified on the alleged dumping of manganese ore from Russia in the United States.

Mr. Doherty told the custom experts that the ferromanganese of commerce and the only ferromanganese that would be accepted in the trade must contain 78 to 82 per cent metallic manganese, stating further that in view of the vast production and small consumption of manganese ore in Russia, dumping is not merely inherently improbable but it is in fact an economic impossibility.

"It is a matter of actual fact," he stated, "that the manganese ore which is exported from Russia to the United States is not sold in or used in Russia at all. Manganese ore sold for export to the United States from Russia is not sold at prices lower than it is sold to other countries."

Mr. Doherty continued, "This fact is easily demonstrated. Manganese ore is a world product. There are world markets for it and there are world prices quoted and published as freely as the price of sugar and any other commodity of world-wide importance."

Government representatives issued a statement at the hearing that the Amtorg Trading Corp., representing Russian producers, did not care to present testimony at the case.

J. Carson Adkerson, president, American Manganese Producers' association, and A. C. Clark, affiliated with the Chapin Exploration Corp., Chicago, both made statements on behalf of the domestic producers, largely duplicating their testimony at the previous hearing Aug. 22 held at Washington, also before Mr. Lowman and custom officers.

At that time they asserted that the domestic manganese industry is practically at a standstill because of the imports from Russia and that it is being practically wrecked by the ruthless dumping program of the latter country.

Johnstown Steel Plant Reduces Work to 8 Hours

All employes of the Lorain Steel Co., Johnstown, Pa., one of the smaller subsidiaries of the United States Steel Corp., will be on an 8-hour day schedule by Sept. 15. Heretofore those operating continuous processes have been on an 8-hour shift, and they will continue, but those working ten hours during the day will be reduced to eight hours. The company makes alloy steel castings and railroad specialties.

The plant has been operating ten hours a day, from 7 a.m. to 12 noon and from 12:45 to 5:45 p.m. It will close at 3:45 p.m. Wage rates will not be changed, but employes will be paid for eight instead of ten hours. Hours were reduced in preference to a 10-hour day and laying off men.

MOTOR IS WORLD'S SMALLEST

One-half cricket power is the approximate rating of what is believed to be the world's smallest synchronous electric motor. As shown in the accompanying illustration, this motor is about the size of a hickory nut. It was built by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and operates on ordinary house current. It is used in delicate devices which require a constant speed with little power.

Steel Cities' Unemployment Less Than in «Ore Country»

Duluth, whose commercial interests depend largely on operations at Minnesota iron ore mines, had the highest percentage of unemployment April 1, according to additional compilations of census reports. Of its population, 101,417, those out of work and looking for jobs totaled 5444, or 5.4 per cent. Nashville, Tenn., had the smallest proportion of unemployed among cities of 100,000 or more, 1 per cent. Pittsburgh's proportion of unemployed was 3.2 per cent; Youngstown's 2.6 per cent; Gary, Ind., 2.1 per cent; Chicago 4.2 per cent; Detroit 4 per cent, and Cleveland 4.5 per cent.

Unemployment in Cleveland is tending to diminish, according to the current bulletin by the public employment service. The unemployment index for July was 11.60 and for August 10.21. For August, 1928 it was 3.54, and the 15-year average for August is 3.26. The trend is continuing downward, but so slowly that the service bureau, which receives thousands of applications for work and is in constant touch with employers, concludes serious unemployment will prevail through the winter.

Consolidate Two New York Steel Warehouses

New York—The third largest iron and steel jobbing organization in the New York metropolitan district is being formed as a result of an absorption by Egleston Bros. & Co. Inc., 539 Borden avenue, Long Island City, of Froment & Co., 150 Bank street, Manhattan, merger becoming effective Oct. 1.

All operations will be centered at the Long Island City plant and Eugene McK. Froment, head of the Froment company, will become a vice president of the Egleston company, which, with its name unchanged, will continue under the leadership of Albert J. Bragg. A number of Froment sales and office force will be transferred to Long Island City.

The amalgamation involves two companies of many years standing. The Froment company was organized in 1892 by Frank L. Froment, father of the present owner. Egleston Bros. & Co. Inc. is one of, if not the oldest iron and steel jobbing company in the United States. The company was organized 101 years ago and in the earlier days it imported all of its iron from England, much of the tonnage coming over in whaling schooners, then being distributed by the company throughout the greater part of the United States, Canada, Mexico and South America.

Present officers of the Egleston company are Albert J. Bragg, president; James F. Bragg, treasurer; and Ferdinand Cook, secretary.

Illinois Buying New Autos

Chicago—Despite reports on drastic curtailment in the demand for new automobiles in Illinois this year, automobile buyers of the state absorbed an average of 17,246 cars monthly for the first eight months of the year, a decrease of only 6743 cars monthly from the peak of 1929. These figures are given by the research department of the Illinois chamber of commerce. The report lists 12,113 new car sales for August and a total of 137,969 car sales for the eight-month period.

Industrial Men in the Day's News

Norris J. Clarke, Vice President in Charge of Sales, Republic Steel Corp.

HIS first position was office boy for Bourne-Fuller Co., merged into the Republic Steel Corp., which he will now serve as vice president in charge of sales.

BETWEEN 1919 and 1929 he headed his own company, Lake Erie Bolt & Nut Co., as president and general manager.

DURING the war he spent several months as major in the United States army ordnance department.

Photo by Blank-Stoller Inc.

FROM office boy for the Bourne-Fuller Co., Cleveland, now one of the constituent interests of the $335,000,000 Republic Steel Corp., Youngstown, O., Norris Jay Clarke in the space of 34 years (1896 to 1930) has risen to the important post of vice president in charge of sales of the latter corporation, with headquarters at Youngstown. On Sept. 5 he succeeded Harry T. Gilbert, now special assistant to T. M. Girdler, chairman and president. Organizing the Lake Erie Bolt & Nut Co., Cleveland, in June, 1919, Mr. Clarke served as president and general manager until it was absorbed by the Lamson & Sessions Co. in December, 1929, when he was appointed vice president and chairman of the executive committee.

Mr. Clarke was born Aug. 29, 1883, at Cleveland, where he obtained a grade and high school education. When 13 he was employed by the Bourne-Fuller Co. and worked through various positions in the office until 1903, when he was made salesman. In October, 1905, he was appointed manager of the company's Pittsburgh office. In January, 1912, he was elected secretary and director of the Upson Nut Co., Cleveland, and was further advanced to vice president, director and secretary in December, 1918. He held those positions until July 1, 1919, when with others he organized the Lake Erie Bolt & Nut Co., which in August last year acquired the American Bolt Co., Birmingham, Ala. At the time the Lamson & Sessions Co. acquired the Lake Erie company in December, 1929, he was appointed vice president and executive committee chairman.

In August, 1918, while secretary of Upson Nut Co., Mr. Clarke entered the United States army ordnance department, artillery ammunition metal components division, with the rank of major and resigned in December of that year. Mr. Clarke is a director of the Morris Plan bank and Cleveland Tractor Co., both of Cleveland. He holds memberships in Union, Mayfield, Country, Hermit, Mid-Day, Kirtland and Pepper Pike clubs, all of Cleveland, and Duquesne club, Pittsburgh.

In April of this year Mr. Clarke was elected a director of Cleveland chamber of commerce. His chief recreation is golf. His new headquarters will be at Youngstown.

HARRY T. GILBERT, who since the formation of Republic Steel Corp., Youngstown, O., early this year, has been vice president in charge of sales, Sept. 5 was made special assistant to T. M. Girdler, chairman and president. In this capacity Mr. Gilbert will assist Mr. Girdler in important matters of policy in the commercial affairs of the corporation and its various subsidiaries. Mr. Gilbert has been affiliated with the iron and steel industry as a sales executive for many years, having been since April, 1928, vice president in charge of sales of Republic Iron & Steel Co., which formed the nucleus of the Republic Steel Corp. merger. Prior to that time and since 1919 he had been executive vice president of Sharon Steel Hoop Co., Sharon, Pa., Youngstown and Lowellville, O.

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Lewis E. Skinner on Sept. 18 will celebrate his twenty-fifth anniversary as a member of the Joseph T. Ryerson & Son Inc. organization. Since the opening, March 12, 1923, of the Cincinnati plant he has been manager there, but for five years from 1906 to 1911 he traveled Ohio territory while identified with the Chicago office. In 1911 he was appointed district manager at Cleveland, with jurisdiction over the state of Ohio, going to Cincinnati in 1923.

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Frank Parker resigned Sept. 1 as vice president and general manager of Briggs & Turivas Inc., Chicago and Blue Island, Ill., dealer in scrap iron and steel products, in which capacities he has served since September, 1928, to organize his own company to be known as Iron & Steel Products Inc., Railway Exchange, Chicago, to conduct a general trading business in

iron and steel products, railway car parts and equipment. Mr. Parker has been in the iron and steel and railway supply business for 25 years. He was with the Republic Iron & Steel Co., now Republic Steel Corp., for 12 years, leaving 13 years ago to become identified with Briggs & Turivas as general manager. He is a chemical and metallurgical engineer and was offered the office of assistant director general in charge of the scrap iron industry for the United States government shortly before the end of the World war. He now is president, Chicago chapter, Institute of Scrap Iron and Steel Inc., New York.

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Mort I. Marks has been transferred to Chicago as district manager in

Lewis E. Skinner

charge of office and warehouse of Federal Steel Corp., Detroit.

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Ray C. Crouch, works manager, Birmingham, Ala., plant Reeves Bros. Co., now is manager of its Alliance, O., plant.

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Theodore W. Robinson, vice president, Illinois Steel Co., Chicago, has been elected a trustee of the Chicago world's fair to be held in 1933.

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F. H. Chapin, president, National Acme Co., Cleveland, sailed Sept. 5 for Europe where he will establish new machinery sales connections for his company in Germany.

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Richard Ferguson, president, Ferguson Gear Co., Gastonia, N. C., was recently elected president of Turner Mfg. Co., Statesville, N. C., agricultural machinery.

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George E. Poucher, contracting engineer, American Bridge Co., New York, has been appointed assistant division contracting manager, central division.

J. W. Petersen, manager, Canton, O., plant, has been appointed contracting manager, district A, central division, succeeding Mr. Poucher.

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Albert Goldman, 4421 North Ninth street, Philadelphia, has been appointed eastern Pennsylvania and east coast representative of Darwin & Milner Inc., Cleveland, the American division of Darwins Ltd., Fitzwilliam Works, Sheffield, England, producer of high carbon high chromium steels and inventor of patent air-hardening colbalt-chromium steel.

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Arthur G. McKee, head of Arthur G. McKee & Co., Cleveland, engineers, in charge of constructing one of the world's largest steel plants in the Ural mountains, Russia, has sailed for a three month trip to Russia. He will visit Moscow for conferences with Soviet officials and will then visit the site of the $200,000,000 industrial development at Magnitostroy, about 1200 miles east of Moscow. About 30 supervising engineers already are located there and when complete the plant will have a capacity of 2,500,000 tons of steel annually.

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H. L. Miller, formerly district sales manager at St. Louis for Jones & Laughlin Steel Corp., Pittsburgh, has been appointed assistant manager of sales, tube department, in the main office at Pittsburgh.

J. B. Hungate succeeds Mr. Miller in the St. Louis office.

M. C. Brown has been appointed manager of tube sales on the Pacific coast, with headquarters in Los Angeles.

A. P. Holloway has been made a district sales manager, 411-414 Magnolia building, Dallas, Tex. The Dallas office formerly was under direction of the St. Louis office.

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C. P. Mills, formerly a member of Duraloy Co., Pittsburgh, has been appointed director of the chrome alloy department, General Alloys Co., Boston. After graduating from the University of Pennsylvania with B. S. and M. S. degrees, he spent several years in Panama on canal construction. Later he was transferred to Pittsburgh to inspect special steels for emergency dams at Panama. He next was identified with the bureau of water, Pittsburgh, on special bond issue work, and then became designing and sales engineer, Fort Pitt Bridge Works. Shortly after the Calorizing Co., Pittsburgh, was formed he was appointed sales engineer. He remained about a year and then became affiliated with the Koppers Co. on standardization work, and then became identified with the Duraloy Co.

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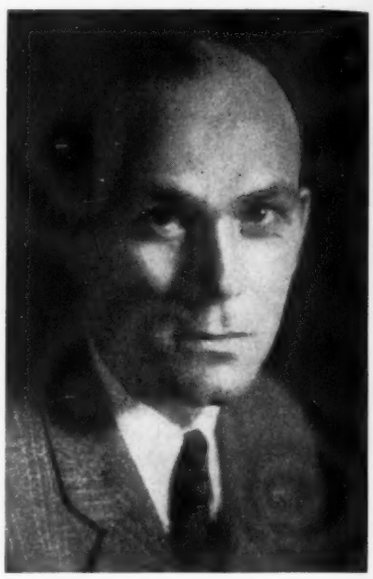
Ray P. Tarbell, formerly Cleveland district sales manager, Lincoln Electric Co., Cleveland, manufacturer of welders and motors, has become a member of the firm of Robert E. Kinkead Inc., Cleveland, consulting welding engineer, as vice president and secretary. This company has established a national reputation as consultant in welding engineering to steel companies, steel fabricators and manufacturers of mechanical equipment. In his new connection Mr. Tarbell will assist Robert E. Kinkead, president, who is an authority on welding procedure and control. Mr. Tarbell, who attended



Ray P. Tarbell

Dartmouth college, has been with the Lincoln company since 1918. He later was promoted to the sales force and then to the Cleveland district sales managership.

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Bruce R. Magness, in charge of billet sales for Hausman & Wimmer Co., Pittsburgh, has resigned.

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Arch H. Hall, for the past ten years associated with the General Motors Corp. at Detroit and with its Canadian subsidiary, General Motors of Canada Ltd., at Oshawa, Ont., has been made purchasing agents of the latter with headquarters at Oshawa. He succeeds E. W. Drew.

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Edgar E. Brosius, president, Edgar E. Brosius Inc., Pittsburgh, builder of blast furnace and steel plant equipment, has sailed for Bremerhaven, Germany, to make an extended tour of the European continent and Great Britain in connection with the foreign manufacture and distribution of his company.

Here and There in Industry

H. K. FERGUSON CO., Cleveland, engineer and builder, has established offices in the Park Square building, Boston, prepartory to starting a $30,000,000 building program in the Park Square district. The office will be concerned with construction of the 20-story Professional Arts building and the 40-story New England building. The office will also handle prospective building in New England. William F. Summers, who has been construction superintendent, has been placed in charge of the office as contracting engineer for the Boston district. He has served as designing engineer for the New York and New Jersey state highway departments and as superintendent for the Newark Paving Co., Newark, N. J., and the Union Paving Co., Philadelphia.

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Victory Engineering & Sales Co. Inc., Detroit, has moved its business to 2950 Woodbridge street east, where larger quarters are available.

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American Manganese Steel Co., Chicago Heights, Ill., has moved its Cleveland office to room 909 Midland Bank building. A. R. Sittig is in charge.

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Foreman Motor & Machine Co. Ltd., Toronto, Ont., maker of marine engines and engine equipment, is located in its new plant at 49 Leslie street, Toronto, Ont.

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Peerless Wire & Fence Co., Adrian, Mich., subsidiary of Brown Fence & Wire Co., Cleveland, opened its wire fence plant Sept. 2. Samuel A. King is superintendent.

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Foote Bros. Gear & Machine Co., 111 North Canal street, Chicago, has appointed J. L. Hart Machinery Co., South Florida and Eunice avenues, Tampa, Fla., its representative in Florida.

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Sheffield Steel Corp., Kansas City, Mo., has opened a branch office at 1122 Straus building, Chicago, in charge of Ernest Baxter, who has been elected vice president of the railroad division.

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American Engineering Co., Philadelphia, has appointed as distributing agents for its electric hoists the Starr-Carpenter Co., Park Building, Pittsburgh, and Weed & Co., 95 Swan street, Buffalo, for their respective districts.

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Buffalo Pipe & Foundry Co., Buffalo, recently organized by Frank B. Baird and associates, has taken over the idle Arco plant of the American Radiator Co. on Austin street, there. Remodeling operations are under way and production of cast iron pipe for the building trade will begin at an early date.

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Rawson Brake & Equipment Co., manufacturer of air brakes for automobiles and designer of automobile equipment, will move manufacturing activities from Detroit to Elizabeth, N. J., Oct. 1. The Rawson company has leased 10,000 square feet of space in the Durant plant at the latter location, which was recently taken over by Bayway Terminal Inc.

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Wood Preserving Corp., Pittsburgh, has been formed by merger of the Ayer & Lord Tie Co., Chicago, and the Century Wood Preserving Co., Pittsburgh. They will continue to operate under under their present names and management with Arthur W. Armstrong and Grant B. Shipley, respectively, as presidents.

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Boye & Emmes Machine Tool Co., Cincinnati, manufacturer of lathes, has given a contract to the Austin Co., engineers, Cleveland, for its new plant on Caldwell drive, Hartwell. The present plant is being abandoned because of terminal improvements by the city. The new plant will be of one-story steel construction, 120 x 260 feet. A 6-ton bridge crane will be installed. The plant is to be completed by Nov. 1.

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Canadian Westinghouse Co. Ltd., Hamilton, Ont., has been given the contract for seven power transformers for the Beauharnois Power Corp., Toronto, Ont., for installation in its power development on the St. Lawrence river. Four of the transformers are designed to handle 33400 horsepower single phase at 220,000 volts, 25 cycle. The other three will handle 53,000 horsepower, 110,000 volts for 60 cycle three phase.

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Triplex Lawn Mower Co., Platteville, Wis., maker of power mowers, has disposed of its entire business including stock, tools and machinery, to White Machinery Co., Eau Claire, Wis. The Triplex company, established ten years ago, manufactured three types of mowers under special patent.

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Massey-Harris Co., Toronto, Ont., maunfacturer of agricultural implements, has effected an amalgamation of its Australian business with that of H. V. McKay Proprietary Ltd., the largest manufacturer of agricultural implements in Australia. No change will be made in the company names or in production programs. The sales in Australia will be united and comorganizations of the two companies petition eliminated.

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Columbian Steel Tank Co., Kansas City, Mo., which has been building truck tanks for transportation of oil and gasoline, has added a new department for construction of truck tanks for transporting milk. The first tank with capacity for 2250 gallons, a cutaway frameless semi-trailer, has been delivered.

Obituaries

FRANK I. FOOTE, 78, pioneer pig iron salesman, well known among buyers in central states and the Northwest, died Sept. 5 at his home in Chicago. For nearly 20 years he had been with the Chicago office of Rogers, Brown & Co., now Rogers, Brown & Crocker Bros. Inc. He was a relative of the late Archer Brown of that firm. During the World war Mr. Foote served in the ordnance department of the United States army, his work having to do with ammunition inspection. He retired from active business about 15 years ago. He was a native of Flint, Mich.

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Thurston W. Ludlow, 72, president and treasurer of Springfield Malleable Iron Co., Springfield, O., died recently at his home in that city. In addition to numerous industrial and civic activities, Mr. Ludlow was president of the board of directors of Springfield conservancy district, which will supervise a flood control plan for the city.

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Charles D. Knight, 59, former manager of the Bloomfield, N. J., plant, General Electric Co., Schenectady, N. Y., died Sept. 5 at East Orange, N. J. Mr. Knight was connected with the company 35 years prior to his retirement. He recently returned from Germany where he had gone to regain his health.

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Carl O. Sternagle, for many years associated with Poldi Steel Corp., Chicago, latterly as western sales manager, died unexpectedly at Chicago, Sept. 2.

EDITORIAL

Thrifty or Spendthrift--- Which Shall It Be?

ARE advanced thinkers rapidly leading public opinion in America to acceptance of a new economic theory which contradicts the age-old doctrine of thrift? Are we as a nation gradually drifting toward a period in which the traditional habits of economy and frugality will be condemned and when prodigality and lavish consumption will be enthroned as desirable traits?

At first glance these questions may appear to be absurd. But are they?

Within the past year a number of competent authorities have openly advocated liberal purchasing as a necessary attribute of the machine age. Last week the newspapers published pictures of workmen smashing radio sets with axes, the captions explaining that the new trade-in policy of a nationally known radio manufacturer now provides for destroying instruments received in exchange for new ones. Apparently the plan is based on the theory that destruction of the equipment minimizes the resale problem and at the same time simplifies the handling of scrap materials.

Plan Wins National Endorsement

On page 26 of this issue a similar procedure for disposing of traded-in automobiles is described. Automobile dealers in northern Ohio sell junkers to a scrap company which pays an agreed upon sum for each car and guarantees that no part of it will be offered for resale in any form other than scrap. This system of motor car disposal, known as the Cleveland plan, has been in force long enough to win the approval of the dealers. And even more important, its apparent success has earned for it the sanction of the National Automobile Chamber of Commerce. With this strong endorsement, the Cleveland plan may be adopted in many communities where the registration of motor cars is sufficient to justify its use.

Should the demolition of radios and automobiles win favor after thorough nation-wide trials, attempts doubtless will be made to extend the plan to sewing machines, washing machines, refrigerators and other products, the sale of which involves the toublesome trade-in evil.

In the event destruction of used articles gains such widespread acceptance as is now indicated, the average citizen will find himself confronted with sharply conflicting influences. On the one hand will be his inherited instinct for thrift and economy, and on the other a newly born impulse to consume goods rapidly and spend money freely. In case the latter policy should win out and should be followed generally throughout the country, the result would be a marked acceleration in the cycle of production, consumption, destruction and reclamation. The "life" of many manufactured articles would be shortened. Production would be increased with attendant benefits to employment and utilization of machines and equipment. Demand for steel, iron, nonferrous metals, rubber, glass, textiles, etc., would be increased, but probably without a correspondingly larger demand on natural resources because of the facilitated collection and handling of scrap.

Theory Is Startling, But Not New

But in spite of any alluring promises of benefits that may be presented, the basic idea behind all of this will shock the man in the street. To deliberately throw away something before it has worn out will seem utter folly to millions of individuals who have been taught that thrift is a basic virtue.

That the idea is startling and revolutionary cannot be denied, yet in many respects it is not new. A generation ago Andrew Carnegie caused steelmakers to gasp with astonishment when he scrapped a good serviceable rolling mill to make room for a better one. Today the policy of replacing obsolete equipment is accepted as sound. Essentially the man who turns in his two-year-old radio in order to avail himself of the advantages of a new model is acting upon the same impulse that prompted Mr. Carnegie to discard his rolling mill.

Viewed in this light the idea is not as radical as it appears at first glance. Perhaps it is not any more revolutionary than the principle of instalment buying, which four short years ago was condemned by eminent bankers and economists as a menace to the country.

We are in an age of speed and change. Our problems differ sharply from those which confronted our fathers and grandfathers. We should assume an open-minded attitude on new ideas which give promise of assistance in meeting the changing conditions of modern life.

Time and experience will test the soundness of the theory of accelerated consumption and lavish purchasing. It is as deserving of a fair trial as were the ideas behind high wages, consumer credit and other recent economic experiments.

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Favored Companies Report Increased Profits in Spite of Business Depression

IN A period when demand for practically every commodity is restricted and prices are extremely low, decreased earnings are accepted as a matter of course. The net income of the majority of companies producing, fabricating or consuming steel was much lower in the first half of 1930 than in the corresponding six months of last year. However, a surprising number of establishments report first-half earnings of 1930 exceeding those of 1929.

This was revealed when this writer reviewed the files of July and August issues of STEEL and DAILY METAL TRADE in search of earnings statements. Startling contrasts were found. One company which reported a net income of a million dollars for the first six months of 1929 lost a quarter of a million in the same period of 1930. Comparisons ranged all the way from this disappointing showing to a number of brilliant reports in which companies almost doubled their net in the first half of this year.

No attempt was made to conduct a thorough study of the earnings of all companies, but by selecting a number of representative firms in each of several important groups it was possible to derive a general idea of how the present depression has affected their profits.

Among the 16 steelmakers listed in the accompanying table only three show a greater net in the first half of 1930 than in the corresponding period in 1929. These three are McKeesport Tin Plate Co., Colorado Fuel & Iron Co. and Vanadium Corp. of America. It is possible that others may have made similarly good records, but their reports have not been published or comparative data were not available. Inland Steel Co. net for 1930 approaches within striking distance of the 1929 figure, and for a corporation of its size, Bethlehem's first half net increase for 1930 compares favorably with that of 1929. If comparable figures were available, National Steel's 1930 net probably would show a parity with that of last year.

The comparisons suggest the familiar question of the relative ability of large and small companies to make good showings in time of depression. Many persons hold to the view that large corporations reap handsome rewards when business is good but suffer disproportionately when times are bad. The corollary is that

Three Steel Companies Report Higher Net Income In First Half Than In Corresponding Period Last Year

	Total net income for first six months		First-half net per share	
	1930	1929	1930	1929
Acme Steel Co.	$ 689,336	$ 1,731,671	$2.01	$ 6.31
American Rolling Mill Co.	1,646,050	4,410,176	.96	3.26
Bethlehem Steel Corp.	17,768,981	20,812,063	4.66	7.21
Colorado Fuel & Iron Co.	1,619,053	1,419,453	3.99	3.48
Follansbee Bros. Co.	4,353	999,660	.14	5.05
Granite City Steel Co.	559,341	892,697	1.91	2.98
Gulf States Steel Co.	—3,537	759,885	.....	.....
Inland Steel Co.	5,341,618	6,134,151	4.45	5.11
Jones & Laughlin Steel Corp.	6,958,696	11,305,687	.....	.....
McKeesport Tin Plate Co.	1,513,850	1,084,562	5.05	3.61
National Steel Corp.	6,102,102	See note *	2.89	.....
Republic Steel Corp.	1,643,241	See note *	2.48	.....
United States Steel Corp.	67,904,524	96,011,290	6.46	11.72
Vanadium Corp. of America	1,250,237	1,177,688	3.30	3.12
Wheeling Steel Corp.	2,351,581	4,137,538	.....	.....
Youngstown Sheet & Tube Co.	5,327,051	10,537,373	4.09	10.12

*Comparable figures for first half of 1929 are not available.

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small companies do not soar as high in prosperity or sink as low in depression as do their larger contemporaries. The figures in the accompanying table afford a measure of support for this theory, although the evidence is not thoroughly convincing.

When we turn to the important consumers of steel, we find a confusing picture. The class I railroads report first-half earnings of $376,570,-236 for 1930 compared with $562,992,000 for the first six months of 1929. On the other hand a number of manufacturers of railroad equipment report net income in 1930 in excess of that for 1929. Among these are General American Tank Car Corp., General Railway Signal Co., and

Net for First Half, 1930, Exceeds That of First Half, 1929

	Net Income for First Half	
	1930	1929
Allis-Chalmers Mfg. Co.	$2,351,540	$2,179,088
American Chain Co.	1,185,215	1,034,029
American Machine & Foundry Co.	1,635,641	1,227,442
Apex Electrical Mfg. Co.	163,269	122,176
Best & Co.	605,387	527,531
Blaw-Knox Co.	1,684,022	1,392,366
Bridgeport Machine Co.	150,319	93,669
Briggs Mfg. Co.	3,531,803	2,422,697
Bucyrus-Erie Co.	1,506,761	1,505,262
Caterpillar Tractor Co.	5,622,965	5,279,431
Dresser Mfg. Co., S. R.	414,691	411,788
Foster-Wheeler Corp.	1,079,630	834,346
General Alloys Co.	76,043	59,960
General American Tank Car Corp.	3,653,699	2,706,723
General Railway Signal Co.	1,170,242	1,049,125
General Refractories Co.	1,381,516	1,206,310
Gould Coupler Co.	310,043	78,799
Harbison-Walker Refractories	2,552,000	2,505,000
Interlake Iron Corp.	1,297,538	1,048,727
International Business Machine Corp.	3,654,310	3,213,601
Mesta Machine Co.	1,271,000	934,120
Metal Package Corp.	314,256	190,388
Superheater Co.	2,435,677	2,209,810
Symington Co.	276,609	156,042
U. S. Pipe & Foundry Co.	1,525,932	826,000
Warner Foundry & Pipe Corp.	128,276	123,391
Yellow Truck & Coach Mfg. Co.	1,437,863	859,659

Symington Co. American Steel Foundries, with net of $2,139,538 compared with $2,802,224 for first half last year, made an exceptionally good record.

Many of the automobile companies have suffered serious reductions in profits, and in a number of cases actual losses are recorded. One of the few exceptions is the Yellow Truck & Coach Mfg. Co. division of General Motors. Among the manufacturers of automobile bodies, Briggs Mfg. Co. seems to have an exceptional record for the first half.

Manufacturers of electrical equipment apparently have escaped the depression with only minor damage. General Electric's sales for the first six months of this year were $197,229,346, exceeding those of $194,353,307 for the first half of 1929. Profit available for dividends, however, this year fell slightly before last year's figure. Westinghouse sales were somewhat less this year, and its net fell from $13,131,380 to $8,358,362 in the corresponding half year. Allis-Chalmers Mfg. Co. reported an increase in net income for first half of 1930.

Among those who furnish equipment, service or supplies to the steel producing industry are several companies whose net income is higher. Among these are Harbison-Walker Refractories, General Refractories Co., Blaw-Knox Co., Mesta Machine Co., and Arthur G. McKee Co. Continental Roll & Steel Foundry Co., formed last June through acquisition of the assets and business of Duquesne Steel Foundry Co., Hubbard Steel Foundry Co. and Wheeling Mold & Foundry Co. reported net profit for six months of $576,536, equivalent to $2.18 per share.

M. A. Hanna Co. with first-half, 1930 net of $1,103,692, compared with $1,733,454 for first half last year fared rather well, especially since its second quarter earnings this year showed a substantial gain. Interlake Iron Corp. reported an increase in net for the first six months of 1930 compared with first half last year.

The appearance on the roll of favored profit-makers of a number of engineering concerns and manufacturers of refractories reflects credit upon the steel producing industry. It indicates that new construction, repairs and maintenance have been continued by steelmakers in spite of reduced income.

Steel's Best Customers Are Hit Hard by Depression

In one respect, earnings reports today differ sharply from those appearing several years ago. It will be recalled that not long ago steelmakers were comparing their average return of less than 6 per cent on capitalization with the average of about 20 per cent enjoyed by their customers in the automotive industry. In the present depression, automobile builders have been hit as hard, and probably harder than even the most unfortunate of the steel producers. The railroads, ordinarily the best customers of the steel industry in point of tonnage, likewise have suffered curtailments in income perhaps more drastic than those which afflict the steelmakers.

Producers of material seem to have been affected even more than manufacturers of finished products. Earnings of copper and brass firms were considerably lower in the first half of 1930.

THE BUSINESS TREND

1930	
Sept.	$10.43
Aug.	10.45
July	10.56
June	10.77
May	10.94
Apr.	11.18

1929	
Sept.	$12.67
Aug.	12.63
July	12.49
June	12.46
May	12.68
Apr.	12.87

Commodity Prices Are at Turning Point

THANKS to scattered but tangible improvements in business conditions, the first week of September has afforded a more substantial basis for optimism than any week for several months. Shortly after Labor day definite inquiries for structural steel aggregated 100,000 tons. Last week an automobile builder contracted for a quarter of a million dollars worth of machine tools. The rate of operations in the steel industry has increased steadily since mid-August. And in addition to these evidences of improvement, we find definite changes in the price situation.

Commodity prices, as indicated by Bradstreet's index, for the first time in almost a year of steady decline appear to have reached a stabilized level. The index number for Sept. 1 is reported as $10.43 compared with $10.45 last month and $12.67 for the corresponding month of last year. During the month of August 28 commodities advanced in price, 27 declined and 51 made no change. On account of the drought such declines as registered in textiles, hides, leather and oils were about counteracted by gains in breadstuffs, live stock and provisions.

Indices Agree in Reflecting Start of Upward Trend

As reported previously in this column, some other indices of commodity prices already have turned. Irving Fisher's index stood at 83.8 for the week ending Aug. 15, dropped to 82.8 in the week ending Aug. 22 and turned upward to 83.3 in the week ending Aug. 29. The weekly index of wholesale commodity prices compiled by the Harvard Economic Society Inc., rose to 80.9 for the week ending Sept. 3, 1930, from 80.7 for the previous week.

The turn in prices of steel and iron probably will lag behind that of commodity prices by some weeks. Thus far the only definite increase in quotations has been in heavy melting scrap. However increased resistance to lower prices is apparent and attempts are being made to stabilize quotations at points somewhat higher than prevailing levels. The next few weeks will witness a test of prices that should be significant in forecasting the trend of steel prices over the remainder of the year.

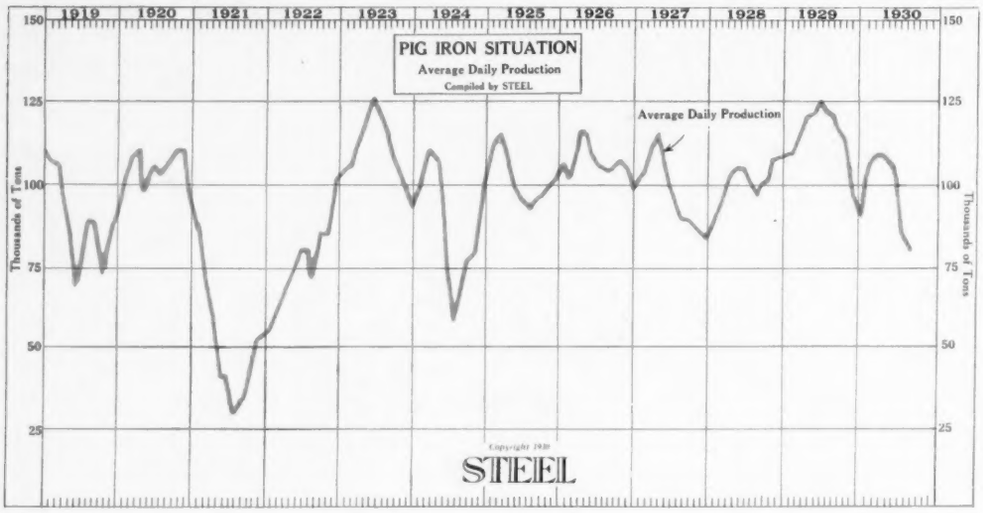
Uncertainty in Automobile Industry Retards Recovery in Steel

The automobile industry still faces a difficult problem. Demand for cars has not been stimulated by price reductions. Production for the first week in September was lower than in the previous week, and a number of builders have revised their schedules downward.

This hesitancy of the automobile industry in getting started appears to be the chief obstacle to the progress of recovery in the steel industry. Demand for steel from most of the other important consuming groups is moderately encouraging and it is felt that if the motor industry were to manifest positive signs of improvement, the moral effect on other consumers would be beneficial.

Other indicators are slightly more favorable. Freight car loadings have increased moderately but still are about 17 per cent below comparable loadings in 1929. Bituminous coal output is up about 4 per cent and a marked gain in anthracite production has been recorded.

Steel ingot output in August, establishing a higher daily rate and representing the first upward trend since February, is the most substantial evidence of recovery reported thus far.



	1930	1929
Aug.	81,585	120,845
July	85,110	122,016
June	97,817	123,837
May	104,564	125,753
Apr.	106,371	122,106
Mar.	104,930	119,662

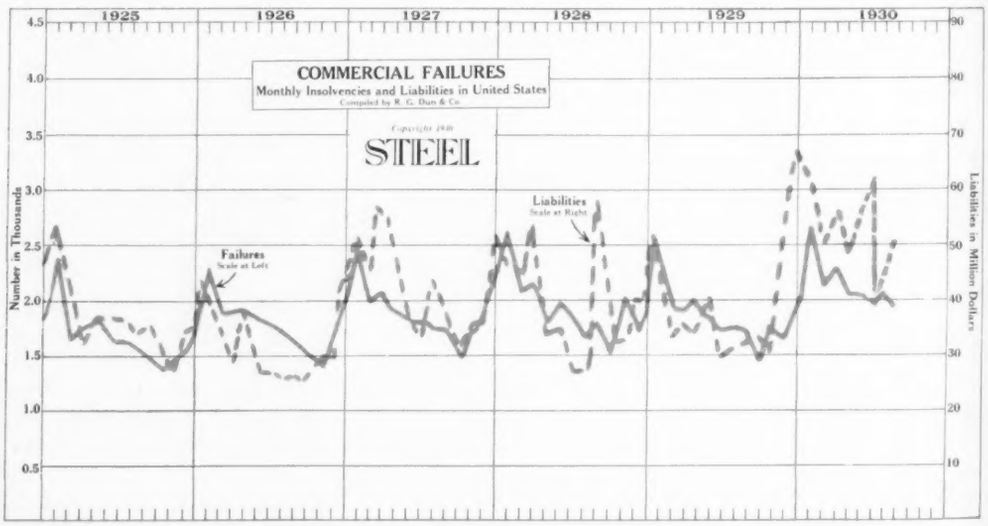
Average Daily Pig Iron Output Is Approaching an Upturn

The average daily production of pig iron for August dropped below the low level reached in July. During August the average daily rate of output totaled 81,585 tons as compared with 85,110 tons in July and 120,845 tons in August, 1929. Although the decline for August was approximately 4 per cent, it shows that curtailment has slowed up materially from the 33 per cent drop that occurred during July. For three months previous to August, reduction of production was accelerated till it reached the high rate established last month. As the present figures disclose, the curtailment of output is slowing down. This indicates that the turning of pig iron production toward more normal levels may not be far off. A substantial rise in industrial activity in September would stimulate blast furnace activity.

Commercial Failures Register New Low for Year

Commercial failures for August, as reported by the R. G. Dun & Co., fell to the lowest level of the year. At a total of 1913, failures are 6 per cent fewer than the 2028 in July, but approximately 9 per cent greater than the 1762 of August last year. It is the first time in almost a year that failures have been under the 2000 mark.

Although failures have been reduced, liabilities have risen from $39,830,000 in July to $49,180,000 in August, which compares with $33,750,000 of August last year, an increase of 24 per cent over July and 45 per cent above August, 1929. Just what significance is to be attached to the declining number of failures and the increasing liabilities is doubtful. It appears that failures are visiting larger companies than heretofore.



Liabilities

Aug., 1930	$49,180,000
July, 1930	39,830,000
Aug., 1929	33,750,000

Number

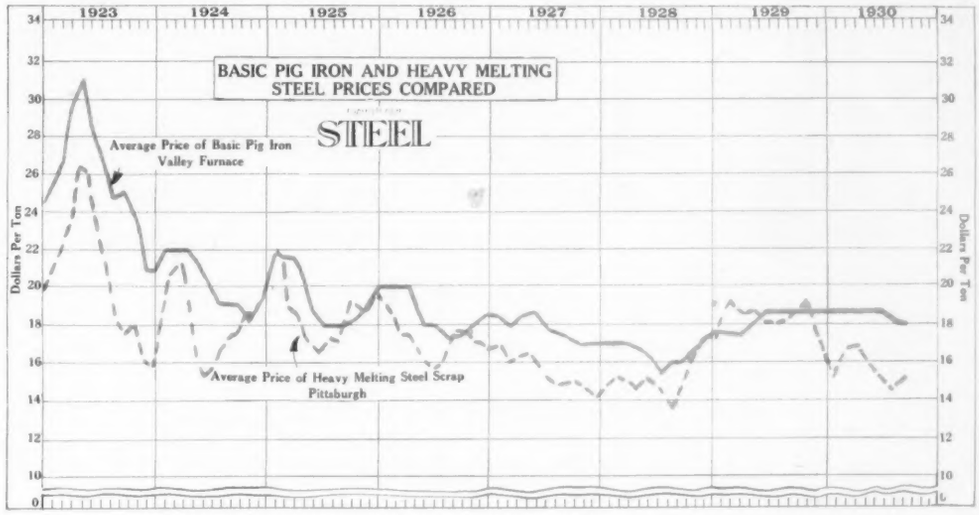
Aug., 1930	1,913
July, 1930	2,028
Aug., 1929	1,762

Basic Pig Iron

	1930	1929
Aug.	$18.00	$18.50
July	18.20	18.50
June	18.50	18.50
May	18.50	18.30

Heavy Melting Steel

Aug.	$15.19	$18.90
July	14.90	18.45
June	15.10	18.30
May	15.40	17.85



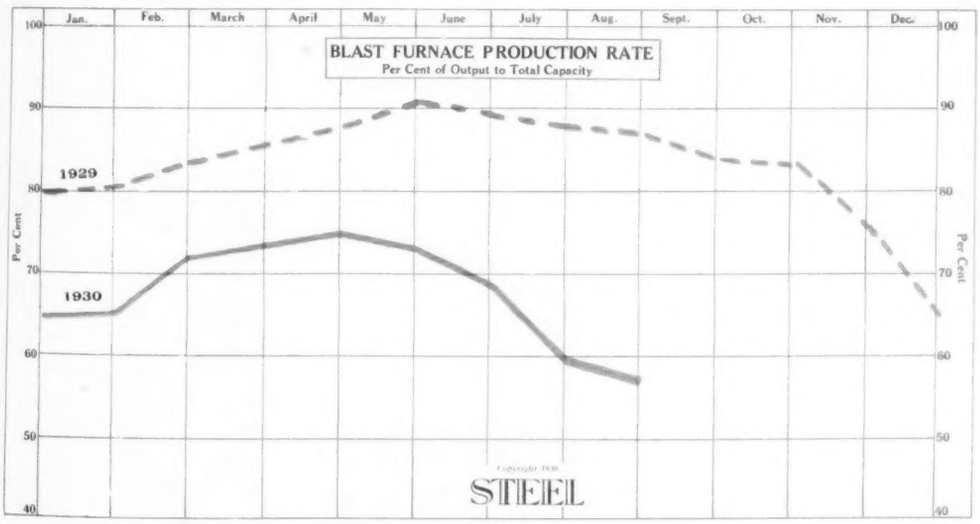
Heavy Melting Steel Scrap Advances After Long Decline

Heavy melting steel scrap turned up in August for the first time since February while basic pig iron, valley, held to the $18 per ton level of July. This increase in heavy steel scrap to $15.19 per ton from $14.90 in July marks the third firming of price since the decline started last August. January and February marked periods of rising scrap prices and, as born out later, anticipated the spring seasonal increase in business activity. Likewise, the weakening of price after that time foreshadowed the slowing down of industrial output during the quiet summer months. Now scrap is again moving forward. If the action of steel scrap in the past is to be considered as significant for the future, then it appears that activity will again be increased bringing better demand and prices.

Decline of Blast Furnace Production Rate Smaller in August

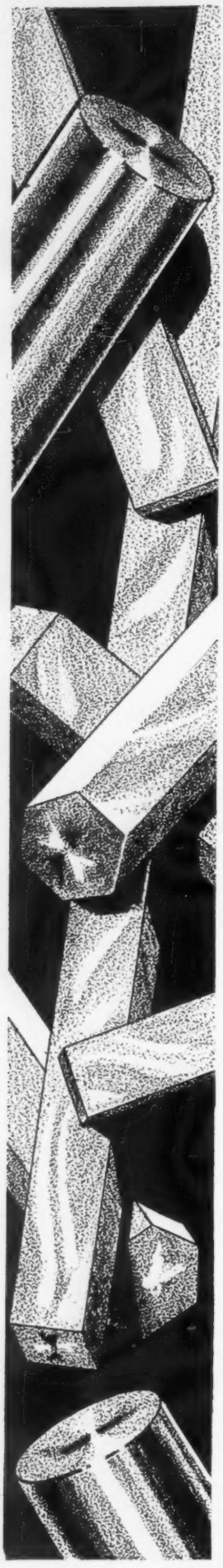
Blast furnace production rate in per cent of operating capacity has been further curtailed in August. For the month operations stand at 57.8 per cent compared with 60.3 per cent in July and 86.4 per cent for the corresponding month one year ago. While production rate has been steadily falling since April of this year, the rate of contraction has become less, suggesting that a turn upward is not unlikely.

On August 31, active blast furnaces numbered 137 against 144 on July 31 and 162 on June 30. During the month one merchant stack was blown in and three were blown out or banked. Of the steelworks class, two were blown in and seven were blown out, making a total of three furnaces blown in and ten blown out or banked, or a net loss of seven stacks for the month.



Per Cent

	1930	1929
Aug.	57.8	86.4
July	60.3	87.2
June	69.3	88.5
May	74.2	89.8
Apr.	75.4	87.4
Mar.	74.5	85.5



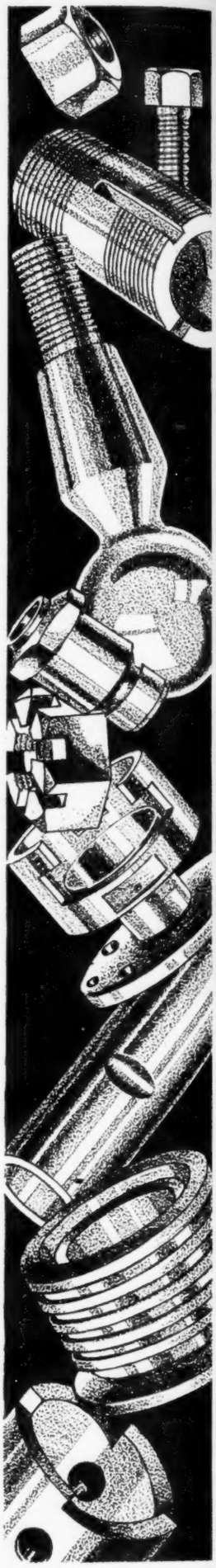
This is Number Three of a Series of Advertisements

THE COLD FINISHED STEEL BAR INDUSTRY HAS MADE HOURS THE UNIT OF MEASURE IN DELIVERY TIME

The Cold Finished Steel Bar Industry carries adequate inventories permitting the quick shipments that present-day buying-practice demands. With frequent regularity, a single carload comprising five, ten, even fifteen different sizes in various chemistries and lengths are ordered and shipped within a few days. Twenty-four to forty-eight hour service on less diversified specifications (say two or three sizes to a carload) is not at all unusual, excites no comment, wins no praise, *yet meets a vital buying need.*

"The Rapid Duplication of Machined Steel Parts at Lowest Cost Continues to Depend Upon That Perfection and Precision Which Only the Cold Finishing Processes Can Give"

THE COLD FINISHED STEEL BAR INDUSTRY



All Costs

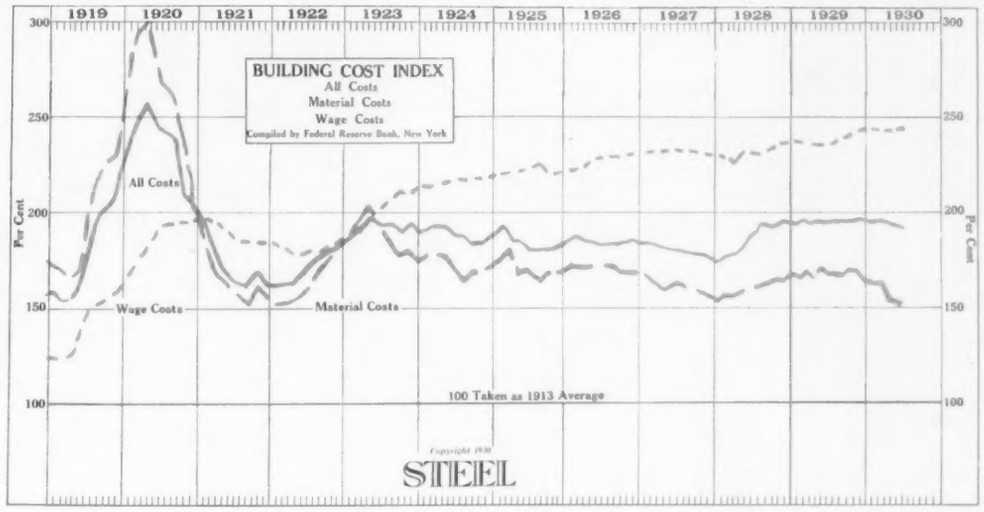
	Per Cent 1930	1929
July	189	194
June	190	194
May	193	194

Material Costs

July	153	166
June	155	166
May	160	167

Wage Costs

July	244	236
June	243	235
May	243	234



Building Cost Index Declines; Wage Costs Advance

Building construction costs in July continued to decline while wage costs increased. According to the figures compiled by the Federal Reserve Bank of New York, all costs declined one point in July to 189. This compares with 190 in June and 194 in July, 1929. Material costs, likewise, have continued a downward trend. During July these costs fell from 155 in June to 153, which is 13 points below the corresponding period of last year. While material and all costs have noticeably declined since the early part of the year, wages have retained their high level and have even advanced, stepping slowly from 242 in January, a figure that has been maintained since September, to 244 in July. With the total cost declining, increasingly attractive levels should encourage more building.

Basic Pig Iron Price Holds; Steel Bars Are Cheapest Since June, 1922

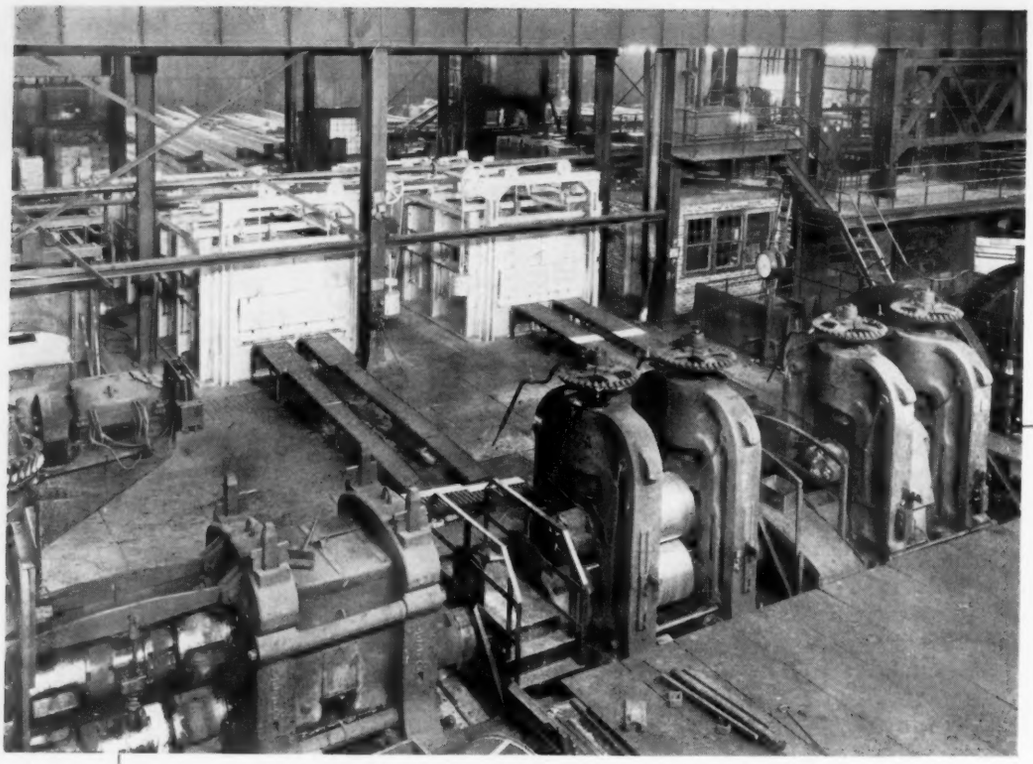
During August prices of steel bars and basic pig iron in the valley both registered moderate declines which were similar in extent to the previous month's reduction. Steel bars at Pittsburg dropped $1 per ton to $33 per ton from the July monthly average price. Steady weakness in price of bars has been evident since the middle of 1929, and with the present fall of quotations the price level is carried back to the monthly average of June, 1922. Basic pig iron in the valley declined to $18 per ton for the monthly average price from $18.20 in July and $18.50 in July, 1929. This decline of the last two months comes after holding at the $18.50 level for over a year. Although both bars and basic pig iron have fallen in price, the spread between them still continues to diminish.

Steel Bars

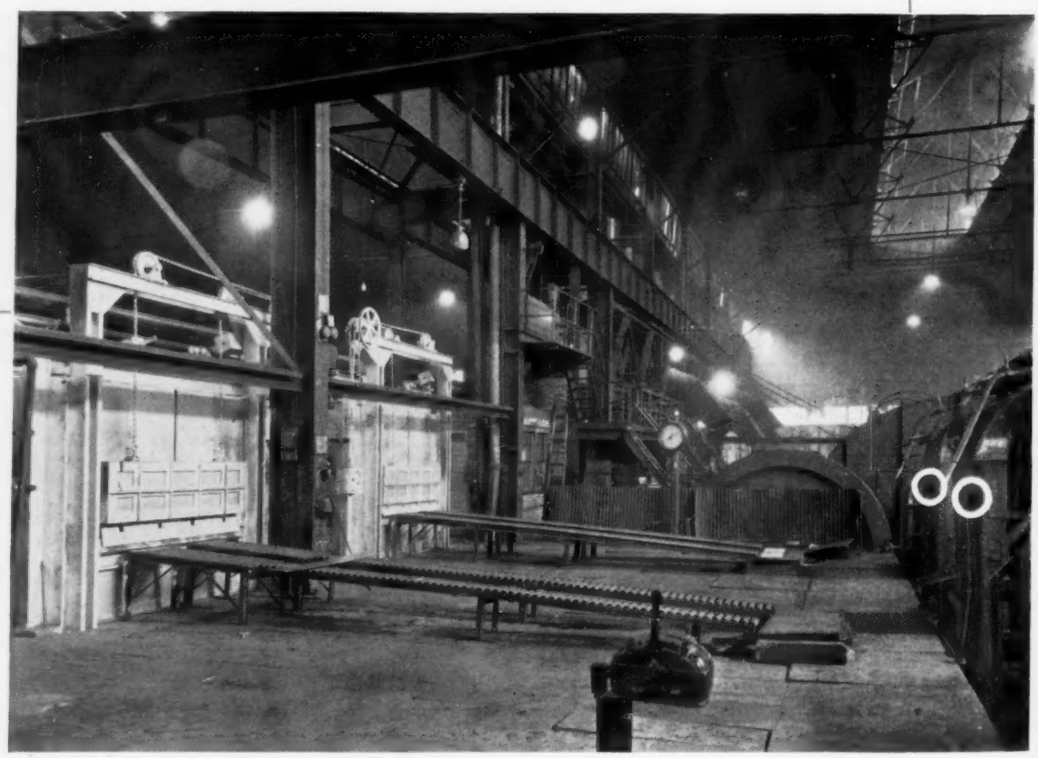
	1930	1929
Aug.	$33.00	$39.00
July	34.00	39.00
June	35.00	39.00
May	35.00	39.00

Basic Pig Iron

Aug.	$18.00	$18.50
July	18.20	18.50
June	18.50	18.50
May	18.50	18.30



AERIAL view showing two of the four pair furnaces, above, and their relation to the roughing mills. Below may be seen the mill floor at the same point showing the discharge conveyor to the mill. A button for discharging the pairs is located at each mill stand. The buttons may be seen in the circles at the right



Sheet Maker Installs Modern Furnaces in Expansion

New Units for Heating, Annealing and Normalizing Will Assist in Raising Monthly Production to 16,000 Tons

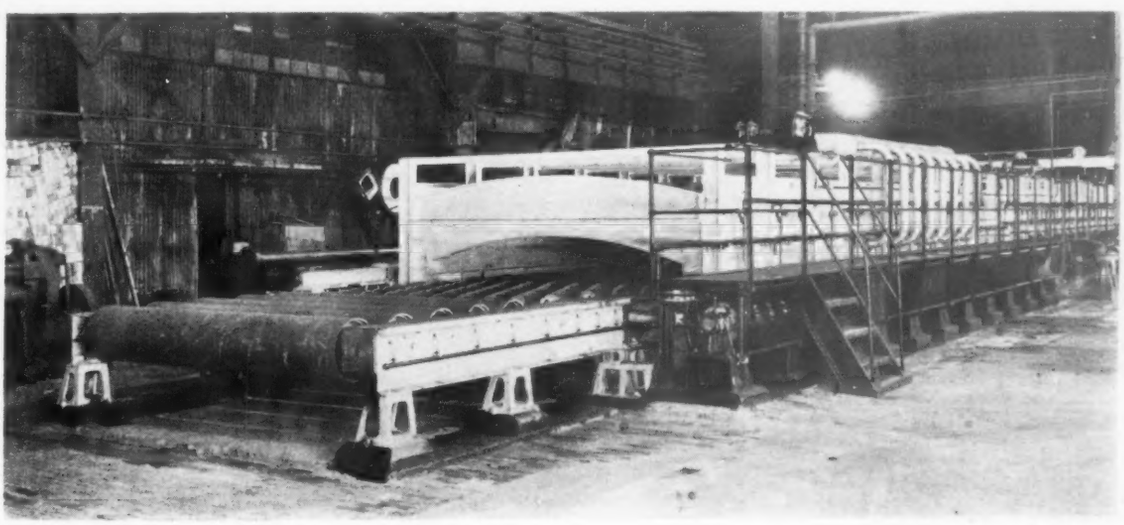
BY W. G. GUDE
Associate Editor, STEEL

MODERN design in heating, annealing and normalizing equipment is incorporated in the expansion program recently completed by the Apollo Steel Co., steel sheet manufacturer, at its plant at Apollo, Pa. This program included the installation of four breakdown mills and three finishing mills with accompanying furnace capacity and the addition of new cold-rolling equipment for the production of full-finished sheets, resulting in a present monthly capacity of 15,000 to 16,000 tons of various grades of sheets, or an increase of one-third over the former capacity. The new upper roll train is laid out for the double mill system for production of single and doubled black iron and automobile sheets.

New furnace equipment consists of four pair furnaces, one for each of the breakdown mills, three pack furnaces for the three finishing mills, and normalizing and box annealing equipment. The pair furnaces are known as the walking beam type, built by the Surface Combustion Co., Toledo, O. Disk-type sheet normalizing furnaces, a product of the same company, are employed. The normalizing capacity is sufficient to take the entire production of the finishing mills.

Pair heating furnace capacity varies with the width of the work; based on pairs 36 inches wide the furnaces have a capacity of 6 tons of charged weight per hour. Two rows of bars are heated one high in the pair furnaces when running on material up to 40 inches wide. On widths of 41 inches and over the bars are piled two high in one row.

The pack and pair heating furnaces have several features in their design that lend themselves well to efficient operation. They are adaptable for use with either roughing or finishing mills, being identical in design in the conveying mechanism and varying only in their operation when used for either roughing or finishing. Temperature over and under the work is constant regardless of the rate of production, thus making for uniformity in temperature from top to bottom of the pack or pair. Evenness in heat distribution in both the heating up and soaking zones brings the work to



Discharge table of the normalizing furnace. The furnace is equipped with a platform which is the top of the gear guard and forms a continuous walkway the entire length of the furnace

Front view of two large end chambers in a box annealing furnace. The chambers have four rail construction to accommodate wide pots, and heavy three point hinged door construction

temperature quickly and maintains it in the soaking zone at the correct rolling temperature without overheating, regardless of mill delays.

Uniform heating of the packs or pairs is assisted by the walking beam mechanism. This mechanism, which is driven by two cams, imparts a uniformly accelerated rectangular motion to the movable alloy rails. These movable rails pick up the packs or pairs, move them straight forward without dragging, and then in turn deposit them in their new position without jarring, from where they are again picked up and carried forward by the next revolution of the cam. The forward movement of the conveyor and load is actuated by gravity, resulting in considerable power saving.

This furnace design anticipates the expanding production of strip steel and the use of strip for breakdown, making a roll change the only requisite for converting a roughing mill to a finishing mill. Close regulation is exercised over the B.t.u. input in the furnaces by means of recording pyrometers. Each of two zones in the pack and pair furnace has its own control valve and control recorder. The record on the temperature chart indicates a consistency of plus or minus 10 degrees compared with the temperature control setting. No heaters are employed and a check of temperatures is made occasionally by the assistant hot mill foreman in glancing at the charts.

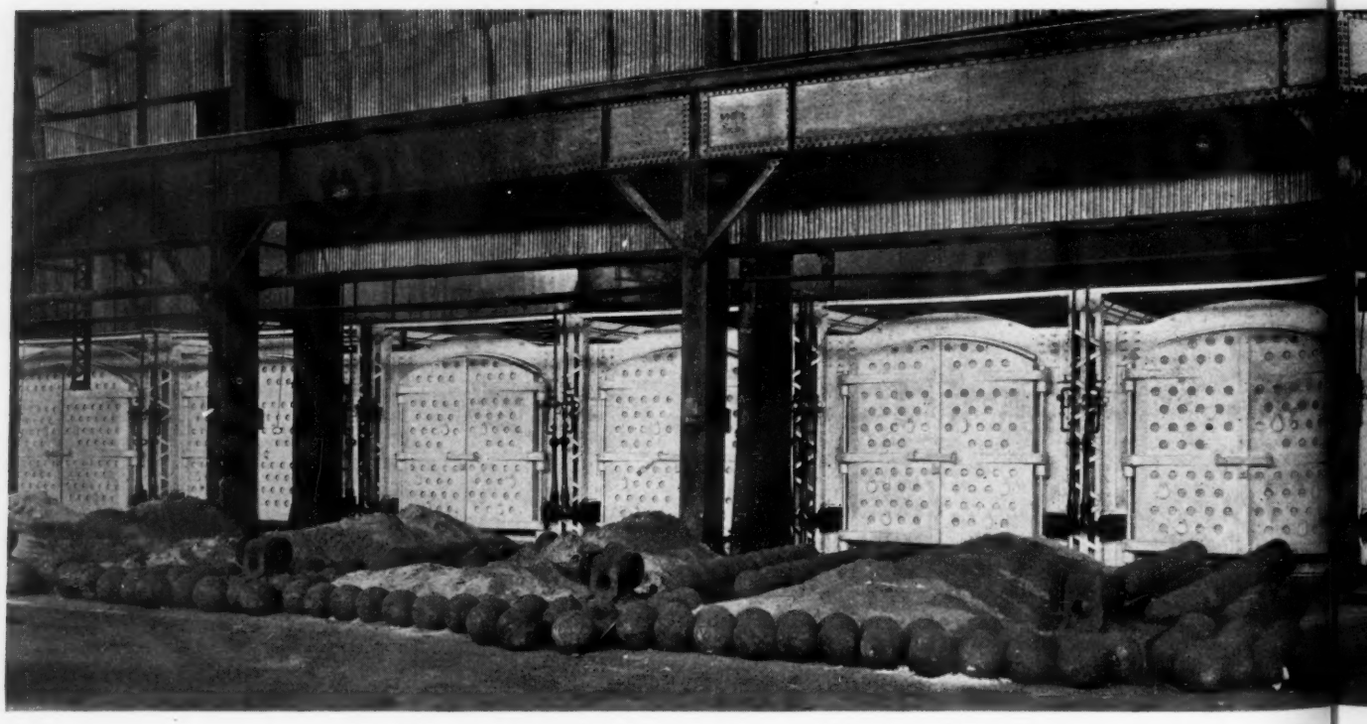
This consistency allows absolute duplication of the temperature from one pair or pack to the following one regardless of the tonnage demand at the mill or of the dimension of the work. In addition, roll temperatures are maintained to close limits, resulting in a roll life of two weeks before re-turning is necessary. Based on seven roll stands, a saving is shown equal to one roll every three to four weeks as compared with former practice. The depth of metal removed in re-turning also has been decreased.

Fuel Natural Gas

In the installation, natural gas at 25 pounds pressure is employed through the use of high-range turndown nonbackfiring equipment. This method permits automatic control of any temperature range with all firing units turned on, thereby retaining the same heat distribution regardless of the temperature range or tonnage demand on the furnace. The air-gas mixture is combusted in short tunnels at each burner in the furnace walls, giving an atmosphere devoid of free oxygen. The firing equipment enriches the atmosphere with carbon monoxide as the pressure is decreased at the burners.

Operation of the pair furnaces is simple. The charger places a bar against stops on the charging table. Provision is made for installation of an automatic charging device, requiring only one man to charge all four pair furnaces. When a pair is re-

Panoramic view of the eleven box annealing furnaces. Boxes are rolled into the furnaces on 12-inch cannon balls

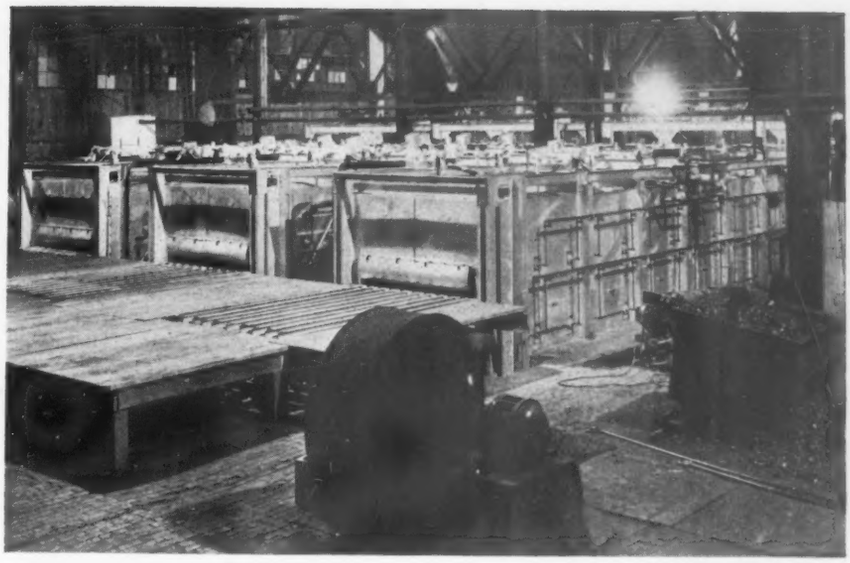


quired at the mill, a button located there is depressed. Usually, the screw boy operates the button when two more passes are needed on previously matched breakdowns. The furnace automatically steps the pairs forward so that one step of the conveyor discharges two bars or one pair through an inclined chute to a gravity conveyor by which the material moves to the mill stands. By proper anticipation the pair reaches the rougher shortly before the breakdown is through the roughing mills and no time is lost in commencing work on the next pair.

Material Moved Automatically

The pack heating furnace differs in construction from the pair furnace only in that the weight of the latter's conveying mechanism is heavier. Material from the pickling department is loaded on the charging platform which extends 10 feet from the furnace, allowing room for the matcher to place the steel on the charging table. The pack is stepped through the furnace to near the discharge door and strikes a limit switch which automatically stops the conveyor's forward movement, and a red light indicates to the rollers when the pack is ready for discharge. When the pack is discharged from the furnace a trigger arm opens a circuit, moving the conveyor forward until another pack strikes the switch arm.

While a pack is being rolled at the mill, the charger places another pack on the charging table. The above procedure is followed on single sheets. On doubled sheets, the following system is used: When first starting the mill the hearth is covered with runovers. A doubling machine is located on the rolling side of the mill adjacent to the furnace, behind which is a chain conveyor leading back to the charging table. When the first runover is rolled the doubling crew receives the pack from the catcher and doubles it, after which it is shoved under a doubling machine hammer onto a chain conveyor.

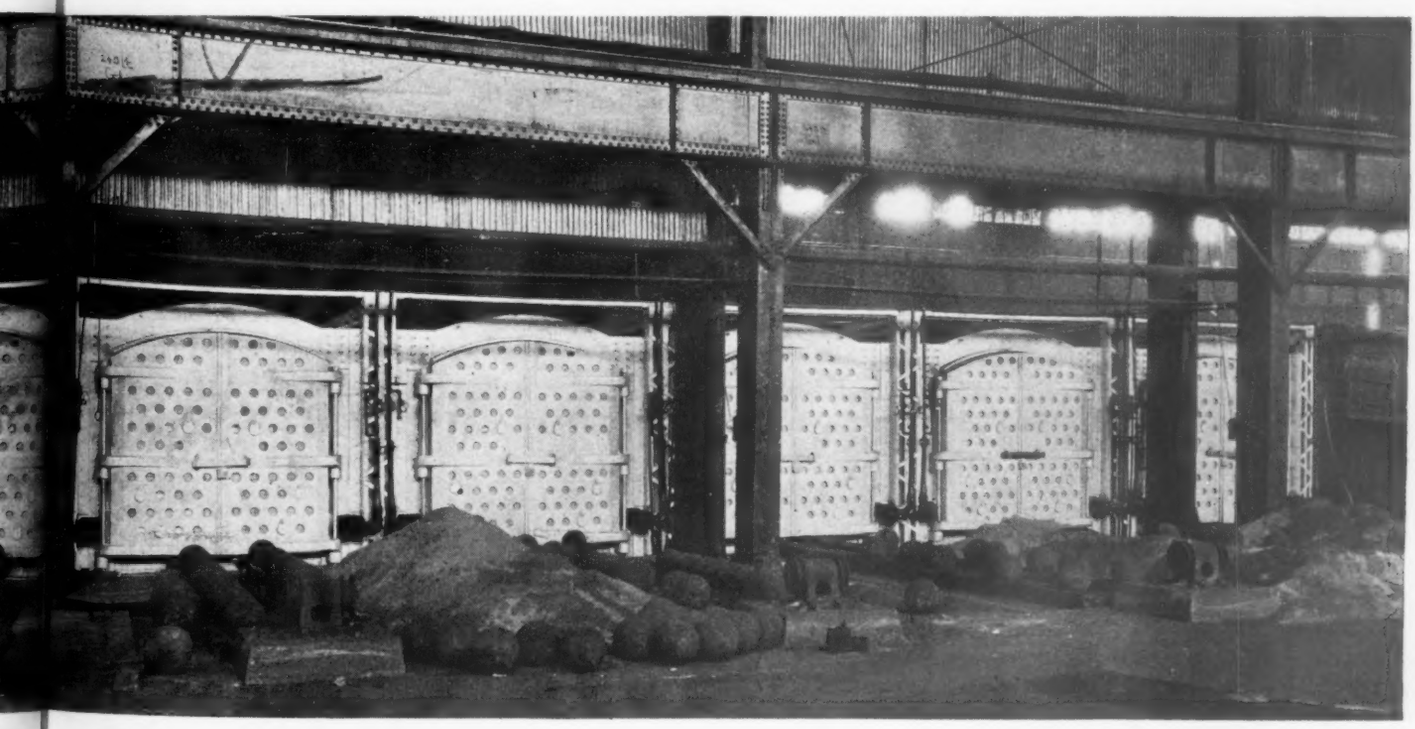


Charging tables of the pack heaters and three-quarter end view of the furnaces

The conveyor delivers the pack to the charging table operator who places the pack on the left hand side of the charging table. As each runover is completed this process is duplicated until the right-hand side of the conveyor is covered with only runovers and the left side with doubled packs. After the furnace is filled, the finishing crew alternately rolls runovers and doubled packs and in this way a consistent temperature is held in the mill rolls. Runovers, after being doubled, are delivered quickly inside the charging end of the furnace and retain a considerable portion of their heat, making for fuel economy.

Finish Shape Does Not Vary

Since the shape of the finishing mill is held constant and runovers and doubled packs are being run on the same shape of mill, this makes greater rolling reduction possible without any effect of patching the pack. It is common practice to cut out a pass on finishing doubled iron packs, with a reduction of two and three times the previous practice on the first pass. Constancy in the shape of the material increases the yield considerably and makes for decreased cost in the opening, and for improvement in the sheet sur-



face. The furnace is designed for automatic discharge mechanism which will bring the pack directly to the mill when a button is depressed on the mill stand.

The normalizing furnaces have been designed to meet the variations in heat treatment required by various trade specifications for sheets and the growing demand in recent years for deep drawing and extra deep drawing material, and have incorporated in them a wide flexibility in the normalizing and annealing ranges with close control over the heating and cooling of the work. The furnaces are 108 inches wide inside with a 50-foot heating zone and a 35-foot cooling zone. Firing equipment is of the nonbackfiring type and is placed over and under the work. Fuel distribution is arranged to prevent overheating of the edges of the sheets through a minimum of circulation of gas past the edges. About 2 horsepower is required to drive the furnace.

A separate control room is provided for all instruments. Three-point type controllers are employed. Temperature of the sheets as well as of the gases is recorded and this feature makes possible the regulation of the speed of the furnace according to a radiation pyrometer so that regardless of the atmospheric temperature the sheet temperature is maintained at a predetermined degree.

The normalizer hearth is of the disk type with water-cooled shafts. Fuel consumption is low and heat loss in the water has been reduced to about 10 per cent of the loss on old types of normalizer shafts. Water is recirculated through a pump and elevated tank and incoming water in the furnace is held at 120 degrees Fahr., this making for fuel economy. The shafts are underslung, permitting removal and replacement in an emergency while the furnace is still hot. Underlying brick work is laid in block joints making necessary the disturbing of no other section or part of the furnace if a shaft removal be required.

The main feature of the box annealing furnaces in the maintenance of uniformity of heat input into the work regardless of the size of the charge. It has been found that the heat cycle on any charge is 20 per cent shorter than that for the old type of box annealing furnaces. Heat distribution is accomplished through six burners all interconnected to one common operating valve. All of the chambers are connected with common division walls and a system of firing is used whereby the heat input under the box is so distributed that a thermocouple placed at the bottom of the sheets and another at the top both indicate about the same temperature throughout the entire heating cycle.

The furnaces at the Apollo plant were designed to occupy 142 feet length of floor space, 11 box annealing chambers being required to handle the output of finishing mills. Granulation of corners of piles of sheets is practically eliminated. Two chambers take material 60 to 72 inches wide inclusive and nine handle sheets up to 60 inches in width. Each chamber is equipped with a four-point recording instrument, two points of which are for the thermocouples in the work and two points for the back and front of the furnace outside the pot. To lengthen pot life the large chambers are equipped with four rails using 12-inch cannon balls.

Charging end of pair furnace showing operator loading pairs, one row of bars, two high

Electrochemists To Discuss Automobile Part Corrosion

Corrosion of automobile parts, its causes, methods of prevention, and methods of elimination will be one of the most important topics to be discussed by the American Electrochemical society at its fall meeting Sept. 25-27, at Hotel Statler, Detroit. The technical sessions will investigate the problems with all the latest developments taken into consideration. Photographs will show what a good chromium plate will look like, while an investigation on the results which calcium chloride, used on roads to lay the dust, brings about in corrosion will be discussed.

Other contributions will be concerned largely with the electrodeposition of various metals and alloys.

Engineers and metallurgists from this country and abroad will record their experiences in producing high-test cast iron at a round table session conducted by Dr. Richard Moldenke. Melting temperatures decidedly above those formerly employed appear to be an essential step in the manufacture of the new product. Advocates of the electric furnace will point out the advantages over fuel-fired furnaces for the melting of the iron. Inspection trips to some of the more important plants of the Detroit area will complete the program.

Some of the principal papers on the corrosion of automobile parts to be delivered at the meeting are as follows:

"The Causes and Prevention of Corrosion of Automobile Parts," discussion led by Dr. F. N. Speller, engineer, National Tube Co., Pittsburgh.

"Protection of Iron and Steel Against Corrosion by the Application of Zinc and Cadmium Coatings," by C. L. Hippensteel and C. W. Borgmann, Bell Telephone laboratories, New York.

"Corrosion of Aluminum Parts," by O. W. Storey, Burgess laboratories, Madison, Wis.

"Stainless Steel," by Prof. E. Newbery, University of Cape Town, Cape Town, South Africa.

"Chromium Plate on Radiator Shells," by Prof. O. P. Watts, University of Wisconsin, Madison, Wis.

"How to Improve the Resistance to Corrosion of Chromium Plated Automobile Parts by Heat-Treatment," by R. J. Wirshing, General Motors Corp., Detroit.

"New Methods of Determining How Resistant Certain Metals or Metal Deposits Are to Corrosion," by Karl Pitschner, Firestone Steel Products Co., Akron, O.

"How Calcium Chloride Has Brought About More Intensive Corrosion," by H. S. Mougey, General Motors Corp., Detroit.

The Detroit chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, J. W. Robinson, Higgins-Bothwell Co.; vice chairman, C. P. Richter, Central Alloy Steel Corp.; and secretary-treasurer, H. W. McQuaid, Timken-Detroit Axle Co.

Another Timken Bearing Record

Three Years in Tube Mill Service Without a Single Failure

The Timken Bearings used on the main rolls of the original Mannesmann 36″ piercing machine in the plant of The Timken Steel and Tube Company have a capacity of 103,500 lbs. per roll neck at 90 RPM.

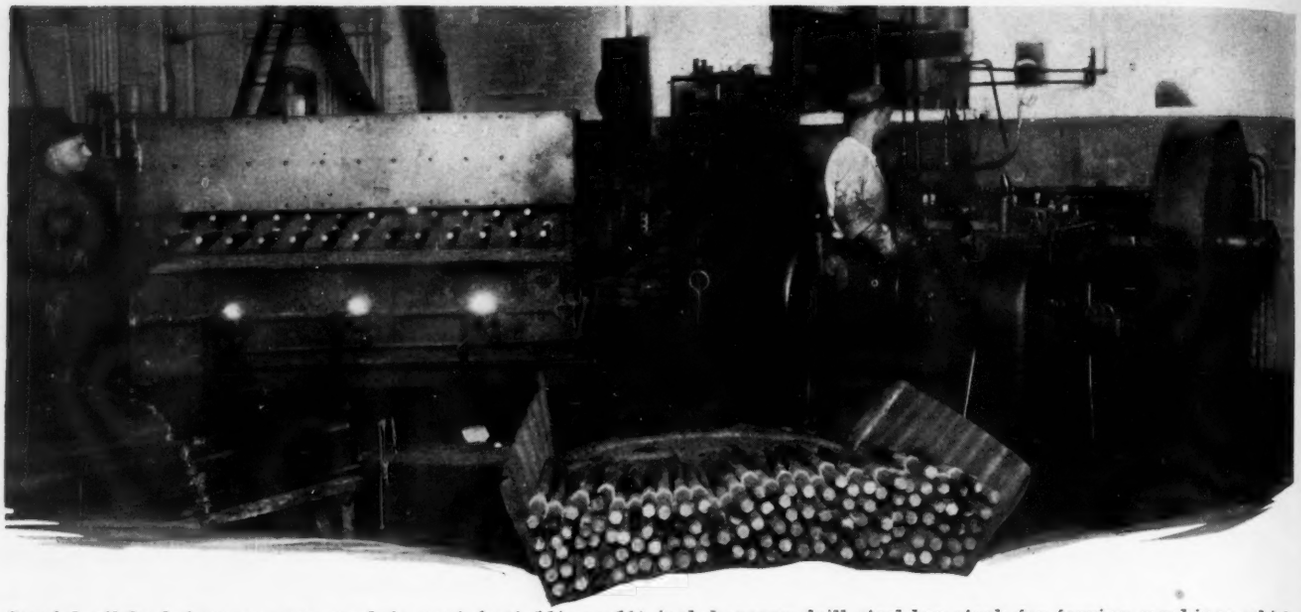
They were installed in 1927, and have been in regular service ever since. During this time several sets of rolls have been worn out, but the bearings are still in good condition—a performance record previously unheard of in tube mill operation.

Timkens have also demonstrated similar dependability and long life in the thrust blocks of this mill, with a thrust capacity of 149,000 lbs. at 500 RPM, in the reelers, where the load capacity is 175,000 lbs. per roll neck at 300 RPM; and in the re-rolling stand where a capacity of 181,000 lbs. at 85 RPM is required.

The power conservation characteristics are approximately the same as in Timken-equipped bar and sheet mills in service at the Timken steel plant and elsewhere, reduction in power demands of from 30 to 50% being the rule, together with large lubrication savings.

In view of these splendid time-proven results, the 36″ tube mills installed in the new plant of the Timken Steel and Tube Company have likewise been equipped with Timken Bearings. The Timken Roller Bearing Company, Canton, Ohio.

TIMKEN *Tapered Roller* **BEARINGS**



Special oil-fired furnaces are used to spot heat 1⅛ or 1¼-inch hexagon drill steel bar stock for forging machines which upset a collar and swage the shank of pieces intended for chisel bits

Need Careful Heat Treatment in Making Rock Drills

BY H. R. SIMONDS
Associate Editor, STEEL

INDUSTRY is associated closely with rock drills. Raw materials are wrested from the earth with their assistance and they are invaluable in the development of water power and the building of roads for the transportation of industry's products. The impact which cuts away solid rock must be withstood by the steel parts in the drill and this means that high-grade materials and careful heat treatment must be employed in drill construction.

At Phillipsburg, N. J., in the large plant of the Ingersoll-Rand Co., thousands of drills are produced each year and nearly all the parts for these drills are put through an extensive heat treating sequence. The plant is well arranged for the handling of material and the entire process of manufacture including the heat treatment conforms to the best modern practice.

Steels Are Classified

The bulk of the raw material reaches the plant in the form of bars. These are received in carload lots on a siding which enters the steel storeroom. Steels of different analyses are placed in separate racks according to the usual custom and the heat number is stamped on each bar. A heavy shear with a capacity for cold cutting low-carbon bars 4 inches in diameter is located close to the racks and cuts bars to forging length. Many parts in the construction of the drill are drop forgings, but some of the smaller ones are automatic screw-machine products and the bar stock from which they are made is stored in a separate place.

Some idea of the size of the entire plant may be judged from the fact that there are over 200 automatic screw machines in this one large screw-machine department. Midway between the general machine shop and the screw-machine section is located the tool department. This also is a large department and is equipped with modern toolroom machine tools as well as long rows of bins where the small tools are stored. Tools are issued in exchange for checks and a list of checks held is posted daily so that each man can verify the record of the tools charged against him at any time.

The manufacturing sequence for the forged parts is shearing, forging, normalizing, sand blasting, and placing in forgings stores. From these stores the parts are withdrawn for machining as orders may require. The demand for accuracy combined with hardness and resistance to wear for most of the parts of air drills makes necessary high-class, machine-shop equipment and extensive grinding operations. In order to combine heat treating with accurate machining, it has been found necessary to repeat the treatment of certain pieces many times following the various machine operations.

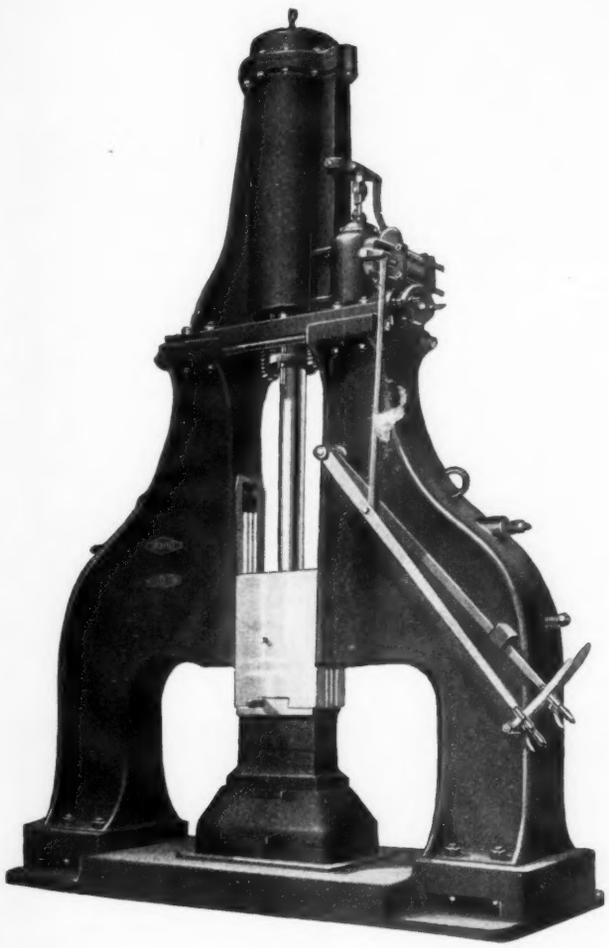
The drill steel which is furnished by the company to go with its air hammers, is nearly all Swedish steel, imported in the form of bars and requiring little additional processing. A collar is put on the typical drill steel bar by hot forming in a special machine and the shank end is carefully squared by grinding. This is an important operation inasmuch as the surface against which the hammer works must be flat and true or trouble will develop in operation. It is important also to have the pistons accurately ground so that there will be no unevenness in the impact of pistons against bars. The rock drill bits are forged hot in a drill sharpener. These drills usually are hollow to provide means for forcing water and air down through the center to remove rock particles from the cutting point. On many of the forgings an air hammer is used to take off the scale just before the final forging operation.

Hammers Operated by Air

An unusual feature about the forge department is the fact that the hammers instead of being steam-operated are air-operated. The department is equipped with many large hammers and some idea of what this means in the use of air may be gained from the fact that the air receiver, which runs practically the length of the department under the floor, is 36 inches diameter and 315 feet long. The air in this receiver is held at 100 pounds pressure by au-

INDUSTRIAL BROWNHOIST
MASSILLON

Forge Ahead To Greater Achievements



Just as the aeroplane industry is forging ahead, making new records, and accomplishing hitherto impossible feats, so the owners of Massillon Hammers are achieving new production records and gaining new customers because they are turning out better forgings.

Massillon Hammers are so constructed that they are strongest where the greatest stresses occur. Turning out accurate forgings with a minimum of time lost through shutdowns, they will help your business to forge ahead.

Industrial Brownhoist Corporation, which has been steadily progressing for more than fifty years in the perfection of its equipment, now builds the hammer you need. Double and Single Frame Forging, Steam Drop, Board Drop, and Tool Dressing Hammers, Trimming Presses and Rotating Blocks are included among its products. Our nearby representative will be glad to furnish you with detailed information.

Industrial Brownhoist Corporation, General Offices, Cleveland, Ohio

District Offices: New York, Philadelphia, Pittsburgh, Detroit, Chicago, New Orleans, San Francisco, Cleveland.

Plants: Brownhoist Division, Cleveland; Industrial Division, Bay City, Michigan; Elyria Foundry Division, Elyria, Ohio.

INDUSTRIAL BROWNHOIST

tomatic control of two electric compressors.

The reason for using air instead of steam is partly because the company is "air minded" in the matter of industrial power and partly to avoid construction of a steam plant which otherwise would have been necessary.

Pistons Carefully Heat Treated

The sequence in the production of standard pistons for air hammers will furnish some idea of the company's heat-treating methods. After the carbon-steel bars are rough machined on automatic screw machines, the pieces go to the heat-treating department for normalizing. This is done in jigs in oil-fired furnaces. Annealing in powdered mica follows and then sand blasting after which the pieces are returned to the machine department for grinding on nearly all surfaces.

The finished parts are inspected and then returned to the heat-treating department for hardening. This consists of preheating at a relatively low temperature in one lead bath and then holding at a higher temperature in a second lead bath and finally quenching in tanks of brine. This brine bath is maintained from 75 to 85 degrees Fahr. After quenching there is a hardness inspection and then the parts are drawn in an electric furnace of the homo type. After this they are cooled in air and are 100 per cent Rockwell tested. A delicate finish-grinding operation corrects any irregularities which may have developed during heat treatment.

The heat treatment of the cylinders is similar to that of the pistons. The cylinders are drop forgings and some changes in temperature sequence are necesary but the method of normalizing and hardening is the same. The small parts are quenched in oil and the large parts in water. Special alloys are used for valves, washers and several other parts subjected to unusual service, all being heat treated.

A large number of low-carbon machine steel parts including those of bessemer screwstock are heat treated by the aerocase process. These parts cover the large majority of nuts, bolts, screws, caps and other similar items entering into the company's products. Altogether more than 1000 different pieces are produced of bessemer screwstock and machine steel. The aerocase process has been developed by the American Cyanamid Co. and is essentially a method of case hardening steel in a liquid bath. The bath consists of two solutions, one a molten salt used primarily as a heating agent and the other a calcium cyanide compound known as an activating material. The latter is added after the bath has reached maximum temperature and causes the carbon penetration.

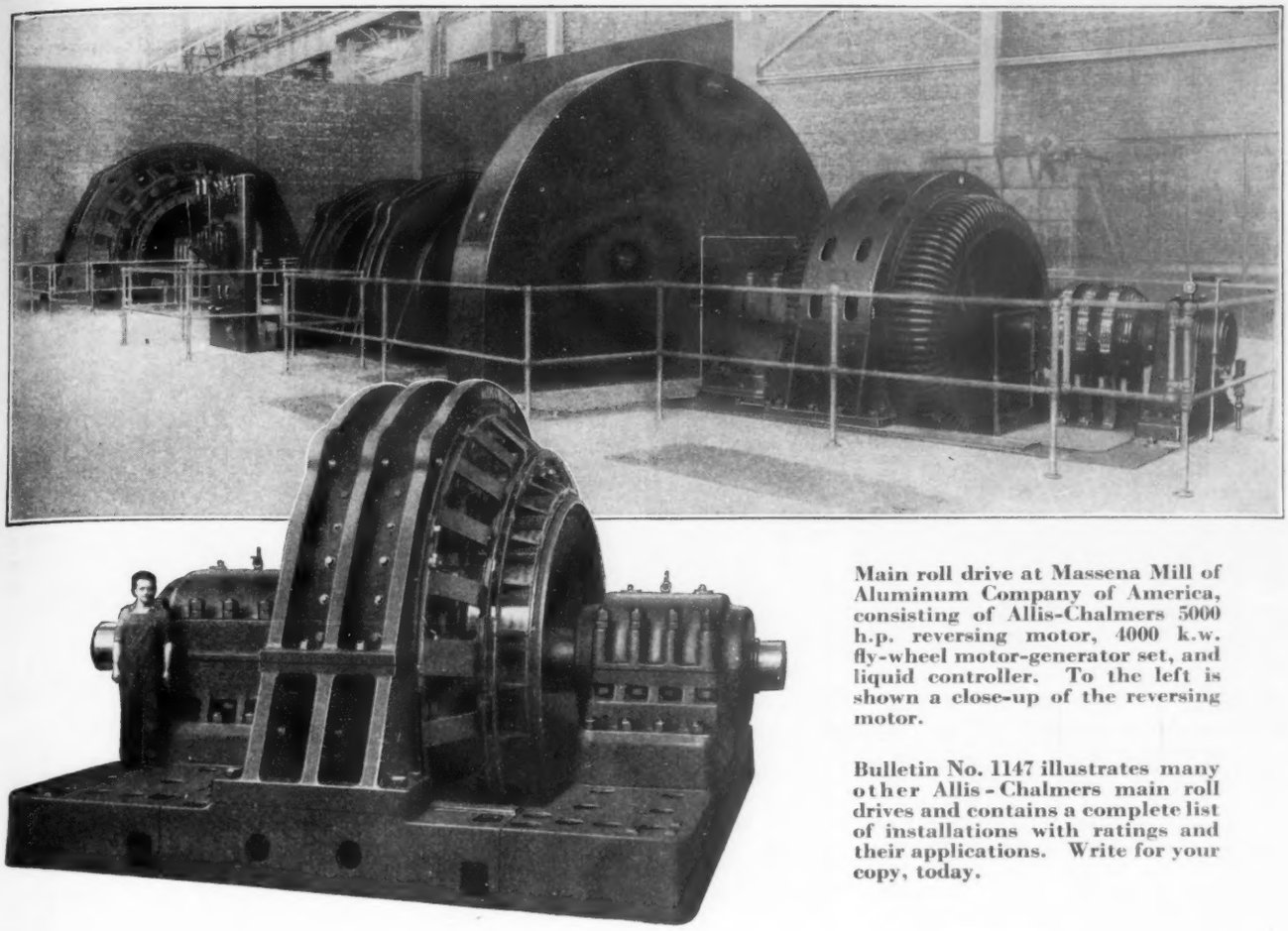
Hardening furnaces and quench tank used for tempering chisel bits. The pieces while in the hardening baths are supported in clusters by an elevated jig

In practice the pieces are placed in nickel-chromium alloy baskets and are submerged in the heating bath. From half an hour to an hour, depending upon size, is required for the pieces to reach the uniform high temperature. The furnaces have rectangular pots 27 inches deep, 19½ inches long and 15½ inches wide, these being made of cast steel and have an average life of four or five months. One pot remained in service for nearly seven months with a total operation record of 1904 hours. With an assumed life for these cast-steel parts of 1600 hours, the cost per hour is about 5¼ cents.

Penetration Is Rapid

Calcium cyanide is added to the hot bath, the amount varying from ½ to 1 per cent of the weight of the first compound contained in the pot. Additional amounts of the second compound must be added during operation to maintain the proper concentration. This usually is done at hourly intervals. During operation a film forms on the surface of the bath and this

All rock drill bits are forged hot in a drill-sharpening machine. Furnaces serving these machines are oil-fired



Main roll drive at Massena Mill of Aluminum Company of America, consisting of Allis-Chalmers 5000 h.p. reversing motor, 4000 k.w. fly-wheel motor-generator set, and liquid controller. To the left is shown a close-up of the reversing motor.

Bulletin No. 1147 illustrates many other Allis-Chalmers main roll drives and contains a complete list of installations with ratings and their applications. Write for your copy, today.

Reversing Blooming Mill Drive ... with improved speed control

THE Massena Mill of the United States Aluminum Company is one of the latest and best examples of a completely electrified rolling mill. All major operations including remelting, casting, and rolling are performed through the medium of electric power.

The blooming mill, which is the largest aluminum rolling mill in the world, is driven by a 5000 h.p., 0-50-120 r.p.m., adjustable speed reversing D.C. motor, powered from a 4000 k.w. fly-wheel motor-generator set. This set, with its liquid slip regulator provides for the absorption of the high peak loads encountered in rolling mill service.

One of the many outstanding features of this drive is the provision of an individual exciter for each machine. This arrangement, together with Allis-Chalmers' design, gives exceptionally high speeds of reversal without the use of the usual heavy main field contactors and the maintenance incident thereto.

All the DC machines are equipped with Allis-Chalmers frog-leg windings, which are inherently 100% cross-connected without the use of external cross connectors or any additional soldered joints.

ALLIS-CHALMERS

Allis-Chalmers Manufacturing Company, Milwaukee

Type of furnaces and containers employed for heat treating various parts of rock drills

acts as an insulator, thus it has been found advisable to skim off some of the film every hour or two. The case penetration is rapid, varying some with the character of the work. A small bolt, for example, is given a case of 0.020-inch in 1¾ hours. After hardening the parts are quenched in water and dipped in a hot 5 per cent soda ash solution. The company has eight furnaces almost constantly in service in this aerocase hardening, each having a capacity for 300 pounds of compound. All furnaces are oil-operated with 30-pound air pressure and the heat-treating department as a whole handles about 30 tons of material a day.

Unusual Design Features Electric Welded Pipe Line

An unusual design, unique in welded pipe construction, will be employed in the fabrication of another electric welded pipe line for the department of water supply, City of Detroit. The latest contract, the third and largest that has been awarded by the city, one of the first municipalities to use welded pipe, calls for 21,000 tons of pipe or 13,700 feet. The contract for furnishing and laying this pipe line was awarded A. Phelps & Son, Detroit, while the pipe will be fabricated by the United Welding Co., Middletown, O. The design calls for ½-inch plates 122 by 173¼ inches and 122 by 212 inches furnished by the American Rolling Mill Co., Middletown, O.

The pipe will be delivered in 40-foot lengths for the 54-inch, and 30-foot lengths for the 66-inch sections. The 40-foot lengths, which are one-third longer than the standard, will be made of four plates in 7000 feet of 54-inch pipe, this increase of 10 feet per section will result in a large reduction of field joints with accompanying economy being noted in field work.

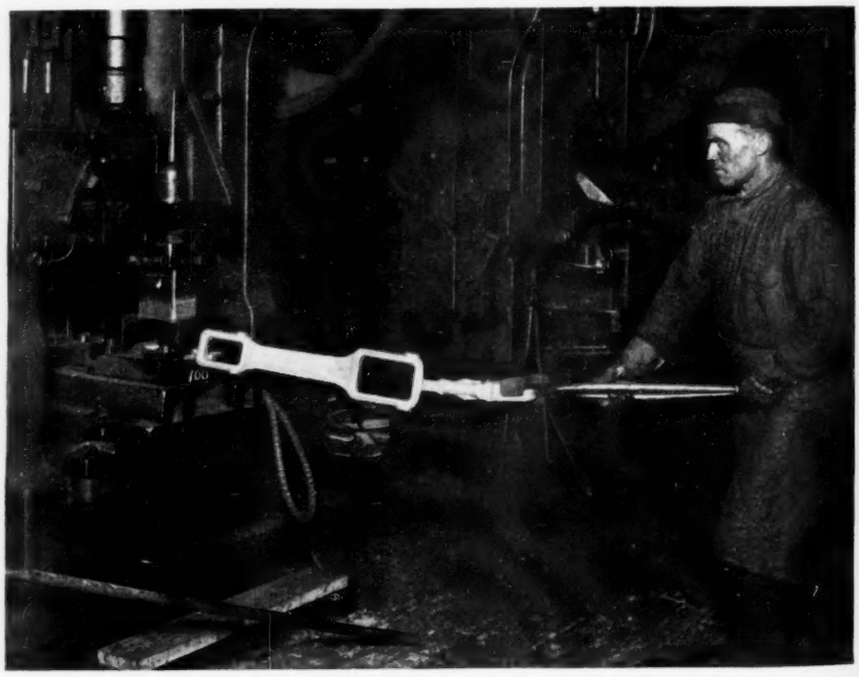
Although of welded construction, the pipe will be formed like the old-fashioned riveted page. Plates ½-inch thick and 122 inches wide, either 173½ or 212 inches long, will be rolled so that one plate will go entirely around, forming a complete ring of pipe. Four of these rings, in the case of the 40-foot sections, will be lap-welded in the shop, to complete each section. This design was first used in the installation of 9300-feet of this pipe last May at Detroit and again in November when a 9000-foot length was laid.

The circular seams lapped approximately 1½ inches will be welded inside and out, while the longitudinal seams will be buttwelded. In and out courses will be used throughout each section of the pipe. The sections will be carefully tested for tightness and the surface thoroughly cleaned and dipped in protective coating before shipment.

This combination of the old design and its new application gives a pipe that is unusually stiff, because of the lap-welded circular joints. This makes it possible to place the pipe under deep fills without angle reinforcing rings. Another inherent advantage is the fact that plate metal pipe is not subject to sudden breaks which cause serious interruption to service and great damage to street and adjacent property.

Labor Secretary To Address Steel Founders Society

James J. Davis, secretary of labor, Washington, will be the principal speaker on the program for the regular monthly meeting of the Steel Founders' Society of America Inc., to be held at the William Penn hotel, Pittsburgh, Sept. 11. Other features include an address, "Industrial Research and Progress," by Dr. L. W. Bass, executive assistant, Mellon Institute of Industrial Research, Pittsburgh, and the meetings of the large and small castings divisions of the society.



Fifth operation in the fabrication of an 8-inch connecting rod which includes punching webs from both crank and crosshead pin ends simultaneously

A C-H Lifting Magnet in operation at the plant of the Allis-Chalmers Mfg. Co., Milwaukee, Wisconsin.

Increase the dividends *from your crane investment*

CRANES cost money. And they should be permitted to pay back that money as soon as possible . . . instead of being penalized by the payroll of an unnecessary ground crew.

Equip your crane with a Cutler-Hammer "Red Top" Lifting Magnet and immediately it starts to pay you full dividends besides saving the wages of two to seven men.

The C-H "Red Top" Magnet enables you to speed up metal-handling . . . three and four days' work is done in one . . . jobs no crew of men could handle are accomplished with ease . . . Tons of pigs, scrap, sheets, castings, boxed parts are handled at a single lift without chaining. Throughout your entire plant "Red Top" pays its way.

And when other magnets have "seen their best days," the C-H Magnet will still possess years of full usefulness. These extra years of service and its added lifting power are due to its design and construction.

The chief causes of magnet-failure, shorts and burnouts, are eliminated by the C-H method of vacuum-pressure impregnation. The elimination of non-magnetic material which thus makes room for additional copper is responsible for the super lifting power. The flush innerpole shoe adds appreciably to each lift. The new C-H "automatic drop" Control Panel speeds the discharge and protects man and mechanism besides.

These decided advantages warrant a thorough investigation of C-H "Red Top. Send for the descriptive booklet "*Modern Metal Handling Methods*".

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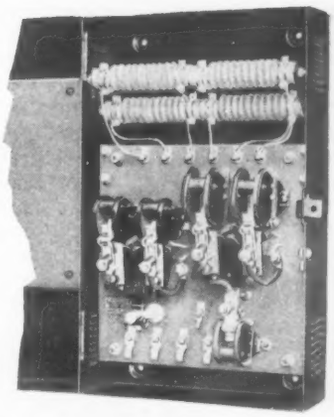


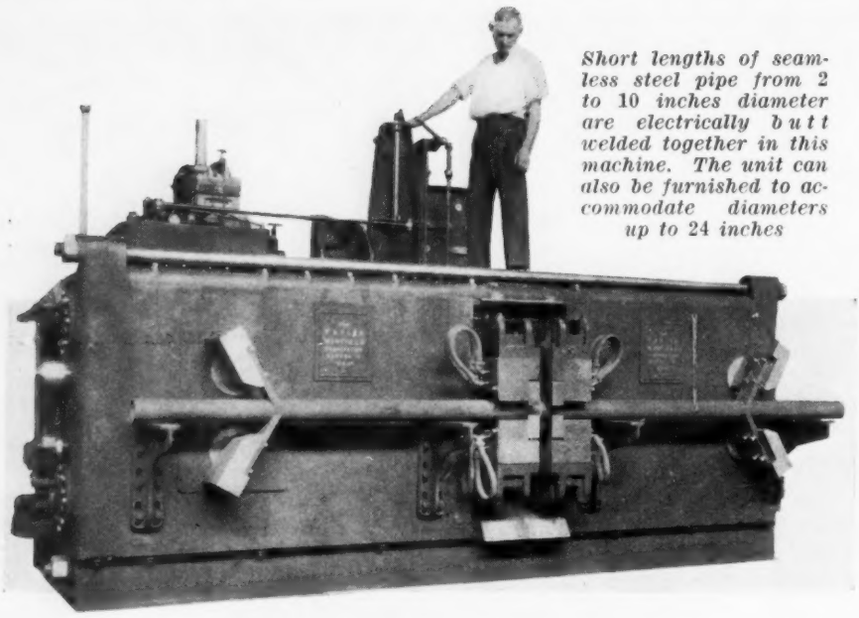
New Automatic Magnet Controller . . . Greater Lifting Capacity, Speedier Operation

Only two-wire, two-position master needed. Discharge-voltage actuates reverse-current switch. Operator simply moves lever to "Drop." His hand returns at once to crane-controls. Current is shut off, reversed, switch opened automatically. Insures current is off magnet on return trip, insures cooler magnet, greater all-day lifting capacity, speedier operation. Furnished as standard on C-H Magnets 39" and larger; also suitable for other magnets 45" and larger.

CUTLER HAMMER

Red Top Heavy Duty Lifting Magnets

(A-329)



Short lengths of seamless steel pipe from 2 to 10 inches diameter are electrically butt welded together in this machine. The unit can also be furnished to accommodate diameters up to 24 inches

Unit Joins Pipe Section by Electric Welding

INSTALLATION of long pipe lines centers is increasing the demand for pumping gas and gasoline from the production fields to distribution for steel pipe of large diameters. This demand has been the principal stimulus to the design and installation of numerous mills for forming and electrically welding pipe, for by this process only can large diameters be produced in long lengths. Pipe of these sizes also is made by the seamless process, but lengths are limited by necessity to approximately 24 feet. Thus, it has been necessary to devise some means to butt weld two sections together so as to reduce by half the number of gas or electric arc welds which must be made in the field.

To make these double-length sections, by joining two standard lengths, resistance flash welding is being employed to advantage because of the rapidity and low cost involved. In the accompanying illustration is shown the latest improved welder for this purpose, a unit designed to operate rapidly and to permit ready handling of the pipe to and from the machine. The welder is manufactured by the Taylor-Winfield Corp., Warren, O.

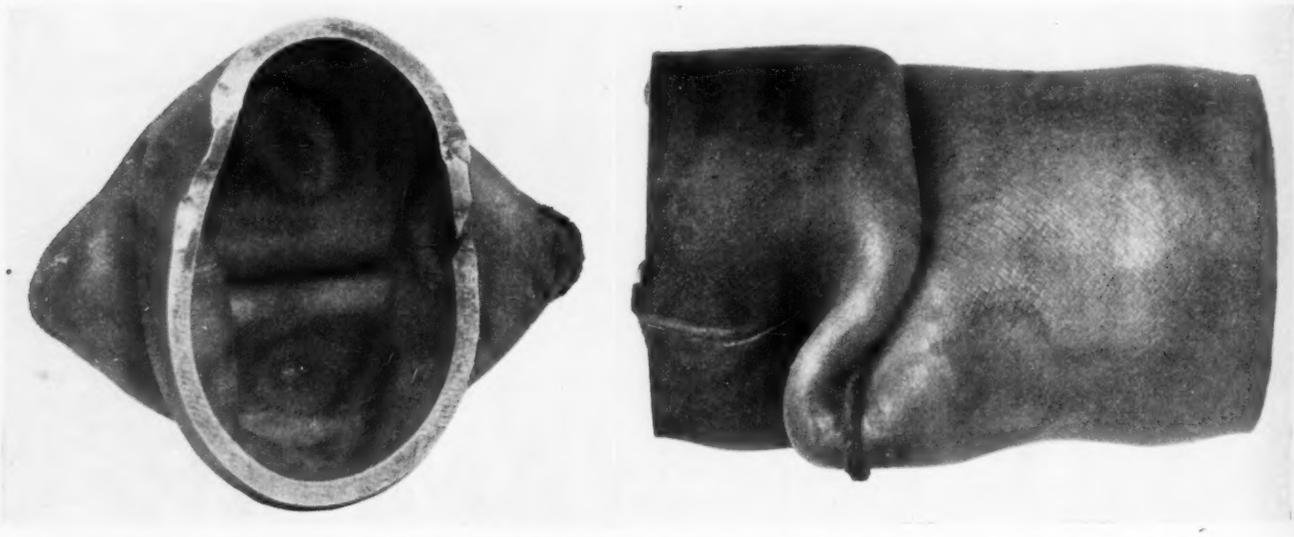
Operating controls for air hydraulics and voltage are placed conveniently for the operator who is stationed on top of the machine where he has complete vision of all operations and at the same time is out of the way of movements of the pipe. Clamping of the current-carrying jaws is accomplished by air cylinders operating through toggles, the jaws being of the equalizing type which always center both sections of pipe to be welded regardless of manufacturing size variations. The backup shoes, which hold the pipe against the heavy pressure required to make the final push for upset of the weld, are hardened tool steel with suitable teeth to engage the pipe. The heavy rocker shafts supporting the shoes are air operated and designed on the principle of a pipe wrench, the greater the pressure, the more secure the grip.

Transformer Carefully Designed

Considerable thought was given to the transformer which constitutes the heart of the welder. It is located close to the current-clamping jaws to obtain high efficiency. The primary coils are completely inclosed thereby protecting them from flash and particles of steel which have been known to cause burnouts. Because of the extreme ranges of pipe that can be held commercially and welded in these units the unit illustrated handling diameters from 2 to 10 inches, provision also had to be made for a wide range of welding voltages. This necessitated devising a new type of multicoil transformer with a novel selective switch to provide a choice of 12 voltages.

While the transformer has been referred to as the heart of the welder, the control device can be called the brain for it is almost human in its action. The hydraulic pressure for operating the push-up as well as the automatic flashing is a motor-driven, constant pressure, variable pump of the self-contained type. The welding

(Concluded on Page 60)



A section of 4-inch pipe containing the section butt welded by the flash resistance method was tested in a 300-ton press with the results shown. The pipe was crushed until the material split but the weld did not open up

Electric Resistance Brazing Affords Durable Joints

BY G. E. GIFFORD
Industrial Department, General Electric Co.

BRAZING consists of heating the metals to be joined to such a temperature that an alloy of the required characteristics melts and flows through the joint section, thus joining the parts at a temperature below their melting point. Such metals as copper, silver, nickel and their alloys, and steel may be united in this way.

Two methods of electric brazing have been developed in the laboratory of the General Electric Co., Schenectady, N. Y. and are now in common use in production. One method depends for its heat upon the electrical resistance of the metals being joined; in the other method heat is generated by passing current through a pair of carbon blocks with the joint clamped between them. The carbon blocks, having a relatively high resistance, heat readily and the heat is conducted into the pieces being brazed.

Brazing Pressure Varies

The first of these two methods makes a joint at lower temperatures, but requires higher pressure and more current because of the low resistance of the circuit. For this reason, the process is known as "pressure brazing" to differentiate it from the second method which is known as "resistance brazing." The latter method uses much less current because of the high resistance of the carbon electrodes. Higher heat is developed and, therefore, less pressure is required to make a joint.

The equipment necessary for resistance brazing consists of a transformer, leads, foot switch, and tongs for holding the carbon blocks. The sizes of the various parts naturally depend upon the size of joint to be made. For brazing cables, conductors, bars, etc., up to 300,000 circular mils in cross section, a 5-kilovolt-ampere, air-cooled transformer weighing 45 pounds is required. This transformer has a 220-volt primary and an 8-volt secondary, and will carry a momentary overload of about 400 per cent. Joints made of parts having a cross section of between 300,000 and 2,000,000 circular mils require a 10-kilovolt-ampere transformer.

A standard 10-kilovolt-ampere brazing transformer weighs 95 pounds and is designed to carry 400 per cent overload. It is wound with a 220-volt primary and an 8, 10 and 12-volt secondary. The 8, 10 and 12-volt taps can be changed readily for different sized joints, the higher taps being used for large sections. Joints made of material larger than 2,000,000 circular mils are brazed in stationary machines or presses. Several types and sizes of tongs are used for applying the carbon electrodes to different kinds of work.

Type of tongs used for applying the carbon electrodes to flat work

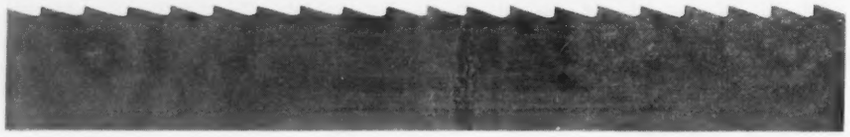
In preparing a joint, the various parts to be brazed are designed either with flat surfaces or are flattened before they are clamped in the tongs. Flat plates are substituted for tubular terminals, and when such plates are more than 1-inch wide they are slotted to reduce the heat radiation during the brazing operation. In these cases each 1-inch section between slots or saw cuts is brazed as a separate operation with a portable apparatus. Stranded cable is brazed by binding with thin copper strip or wire and flattened in a vise or with a hammer.

UNIFORM temperature is of utmost importance in securing a sound brazed joint. If one part of the work is hot and another at a lower temperature imperfect fusion results. Evenly heated joints are one of the advantages afforded by the electric resistance method of brazing which now is used widely by a large electrical equipment manufacturer. Details of the method and the fluxes are described in the accompanying article by G. E. Gifford, industrial department, General Electric Co., Schenectady, N. Y.

Silver Alloys Used

Up to the present time the alloys generally used as a brazing medium have been silver alloys, the silver content ranging from 10 to 50 per cent. The melting point of the alloy varies inversely with the percentage of silver. The alloy containing 10 per cent silver melts at 830 degrees Cent. the one containing 30 per cent silver melts at 735 degrees Cent., and 50 per cent silver alloy melts at 725 degrees Cent. In order to protect the insulation and prevent the overheating of small copper wire, it is essential to keep the brazing temperature as low as possible. For this kind of work the 50 per cent alloy is used, but on larger cables, terminals, etc., this 30 per cent alloy generally is used. The alloy containing 10 per cent silver is best adapted to brazing heavy bus bars, plates and the like.

Fused borax generally is used as a flux but in some cases it is more satisfactory to use potassium acid fluoride in paste form. The borax has a tendency to glaze the surfaces of the carbon blocks and thus to insulate them against a flow of cur-



Bandsaw blade which was brazed by the resistance method at the joint shown

rent. This difficulty is reduced greatly by the use of the fluoride flux.

The flux can be applied either before or after the current, but in most cases glazing is less likely to occur if the flux is not put on until after the work has been clamped between the carbon blocks. The current flow is regulated by a foot switch in the primary or 220-volt circuit, and current is applied until the flux melts. A strip of silver alloy then is held against the hot metal until the alloy flows through between the pieces being brazed. Ony a small amount of alloy is required to make a thin film between the parts of the joint. Heat should be maintained until the borax appears as a thin fluid upon the surface of the molten alloy. Care is taken not to remove the tongs or to release the pressure upon them until the joint has cooled to a dull red color.

High Factor of Safety

During the process of brazing copper conductors, the hot alloy dissolves a thin film of the metal surfaces, thus forming a new alloy which is rich in copper and has a higher melting point than the original alloy. For this reason a higher temperature always is required to open the joint than to make it. In most cases joints are designed to have a contact area of at least one and one-half times the cross section of the conductor. The factor of safety of such a joint is high for it will carry as much overload as the conductor itself without danger of burning open.

Brazed joints have many advantages over lead-soldered joints. As a rule, a brazed joint can be made in from one-half to one-third the time required to make joint with lead solder on the same size conductor. Due to the saving in time and small amount of alloy used, the silver joint is invariably more economical; its conductivity, mechanical strength, and durability are much higher than the lead joint. The brazed joint is considerably smaller and is easily accessible to inspection since all the work is open. It is impossible to inspect thoroughly a joint connecting a tubular terminal to a cable, but a joint made by brazing the cable to a flat terminal or plate is examined easily to see that the bond is perfect.

Insulated cables brazed to a flat bar by the electric resistance method

Resistance method of brazing with heavy tongs. Complete equipment is shown including outlets, cables, transformer and control switch.

Unit Joins Pipe Sections by Electric Welding

(*Concluded from Page* 56)

cycle, controlled by a suitable dial valve can be varied in speed from 4 to 40 seconds as required for different sizes of pipe, the adjustment being infinitely variable and not by steps as usually furnished.

Although the flashing and push-up are fully automatic, they can be stopped or reversed at the will of the operator and a complete cycle started again should for any reason the flashing or preheating be interrupted. This is a special feature of this device. The upsetting pressure and the length of slide movement can be changed quickly and readily to take care of different sizes and gages of pipe, also the copper dies and backup shoes can be adjusted speedily, permitting a rapid or frequent set-up when production so demands.

The welder has all of its parts made substantial and rigid to insure rigidity and is designed to remain properly adjusted under long and severe usage. The heavy box-like castings forming the frame as well as the longitudinal tierods which go through the full length of the welder are further supported on structural steel beams. Although the unit illustrated accommodates pipe in diameters from 2 to 10 inches, the same type of unit can be furnished in three additional sizes, 1½ to 6 inches, 6 to 16 inches and 14 to 24 inches.

Accompanying illustrations show a section of 4-inch pipe which was electrically welded on this machine and afterwards placed in a 300-ton press with the results indicated. The weld did not open up at any point, although the pipe was crushed and the steel split and fractured outside the weld.

The Lehigh Valley chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, G. V. Luerssen, Carpenter Steel Co., Reading, Pa.; vice chairman, H. V. Apgar, Ingersoll-Rand Co., Phillipsburg, N. J.; and secretary-treasurer, L. F. Witmer, Lafayette college, Easton, Pa.

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SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Heat Treatment Determines Manganese Steel Properties

BY HARRY P. EVANS

Metallurgist, Continental Roll & Steel Foundry Co.

TWO major types of manganese steel are used for casting purposes. The first is the Hadfield or high manganese steel of the austenitic type containing 10 to 14 per cent manganese and 1.00 to 1.4 per cent carbon and the second, is the low manganese steel of the pearlitic type containing 1.00 to 2.00 per cent manganese and 0.25 to 0.50 per cent carbon. In addition to the two types previously mentioned, silico-manganese and one or two other special manganese steels are utilized in castings.

Hadfield or 12 per cent manganese steel responds to heat treatment in an opposite manner to most steels. Steels generally become hard by quenching and subsequently become softer and tougher by drawing at points below the critical temperature. Manganese steel is tough and comparatively soft after quenching *dead cold* in water. It is used in industry after being given that treatment. A subsequent draw back at ordinary tempering temperatures makes it hard, brittle and of little use for industrial purposes.

Explains Mechanism

Any steel when heated above its critical temperature passes into the nonmagnetic, gamma iron, austenitic state. Most alloying elements, including carbon up to 1.7 per cent are soluble in gamma iron. Unless an obstructive element is present in solution, it is impossible to hold iron in the gamma condition and the carbon in solution even by the most severe quenching. If an ordinary carbon tool steel is quenched quickly sufficient time is given for a part of the iron to change from the gamma to the alpha state and for some of the carbon to be precipitated in an extremely fine condition. The result is hard martensitic steel. As the cooling rate is reduced, time is given for more and more of the nonmagnetic, austenite to change to alpha iron and for the carbon to precipitate as iron carbide. These progressive cooling rates leave the steel in the troostitic, sorbitic and finally the pearlitic state, on slow cooling. Softer structure than martensitic also may be obtained by quenching severely and then drawing or tempering at the proper temperature.

If a steel containing 10 to 14 per cent manganese and 1 to 1.4 per cent carbon is heated to approximately 1900 degrees Fahr., it passes into the same nonmagnetic austenitic structure that is obtained with a tool steel. However, the large amount of manganese acts as an obstructive element towards the gamma to alpha change and the precipitation of carbon or iron carbide. The whole mass may be obtained as austenite at room temperature by rapid quenching, but the steel is in a metastable condition. If heated or given a draw back, the brake is released and the carbon precipitates as hard, brittle, iron or manganese carbide, the amount depending on the temperature at which the steel is tempered. For that reason 12 to 14 per cent, manganese steel does not retain its toughness at elevated temperatures. Many sound and properly treated manganese steel castings have been made brittle and unsatisfactory by heating, say for forging, bending or even for welding unless that operation is performed intelligently and and all details carried out carefully.

Quenched, strong, tough, austenitic manganese steel is so unstable that even cold work or impact will permit the gamma-alpha transformation and precipitation of carbon. Manganese steel owes its great value to industry, largely to this unique property. When manganese steel is placed in service and receives considerable impact or pounding, the surface goes through much the same change as severely quenched carbon tool steel. It changes, partially at least, to the extremely hard martensitic state. The surface brinell may be raised from 200 brinell or slightly less to possibly 400 brinell. That surface naturally resists abrasion effectively, but it is backed still by the tough austenitic structure. As this hard surface gradually wears away, the subsequent impacts prepare more of this hard surface material and the process continues throughout the life of the casting. It is in that type of service, abrasion with severe impact, that Hadfield manganese steel should outwear any other commercial steel casting. Where abrasion exists without impact other heat treated alloy steels of the pearlitic type such as chrome-nickel, chrome-molybdenum, and others may equal and even excel manganese steel in service.

Intricate Sections Possible

However, even in the latter type of service and in service requiring extreme strength and particularly toughness, manganese steel may be used. When a steel of the pearlitic class is treated to resist abrasion and develop its maximum ultimate strength, it must be quite hard and may be somewhat brittle while manganese steel can be put under the press and straightened without undue fear of breakage. For that reason, manganese steel may be used in fairly heavy and intricate sections when the use of a quenched steel of the pearlitic type is questionable.

The second or pearlitic type of manganese steel contains from 1.0 to 2.0 per cent manganese and 0.25 to 0.50 per cent carbon. While that steel does not develop quite as satisfactory physical properties as more heavily alloyed and more expensive steels of the chrome-nickel and chrome-molybdenum type, at higher brinell values, it has much better properties than many engineers realize. In the normalized and drawn, or quenched and drawn condition, a 0.30 to 0.35 per cent carbon, 1.40-1.50 per cent manganese steel at 200-220 brinell will show an ultimate strength almost the equal of, and a ductility slightly higher than, a .30-.35 per cent carbon, 1.50 per cent nickel and 0.75 per cent chromium steel at the same brinell value. At considerably higher brinell values, its toughness falls off somewhat more rapidly than some of the more heavily alloyed steels. Low

WHILE the uses and heat treatment of manganese steel castings are fairly well understood, the author in this article, which is an abstract of a discussion on the heat treatment of manganese steel castings presented at one of the steel foundry shop operation courses conducted at the recent convention of the American Foundrymen's association in Cleveland, explains the mechanism of the changes which confer special properties on that type of steel. The author, Harry P. Evans, is metallurgist, Continental Roll & Steel Foundry Co., East Chicago, Ind.

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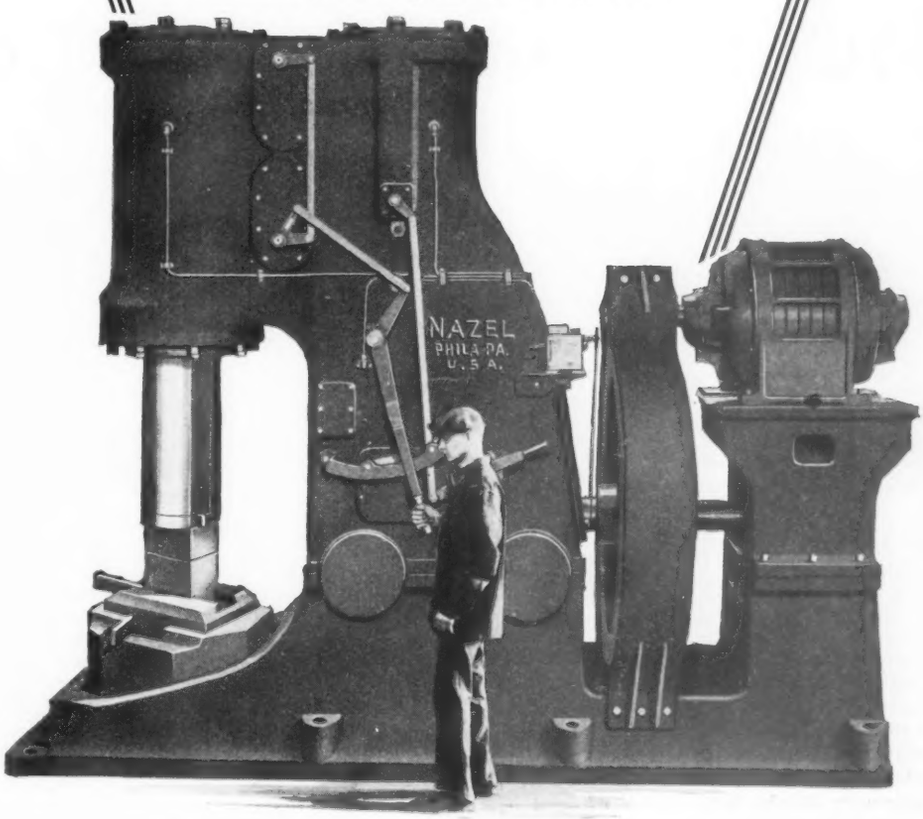


manganese steel is susceptible to heat treatment and, particularly when used at a brinell not over 250, makes remarkable castings. For light castings, and also heavier castings where the section is uniform, that steel gives excellent results by merely normalizing with no draw back.

Heat treatment of low manganese steel is similar to that of others of the pearlitic type. Although manganese lowers the critical temperature somewhat over a straight carbon steel of the same carbon content, the manganese absorption above the critical is slow, so that the annealing or normalizing temperature should not be lowered because of the high manganese content. Because of the lowering of the critical points, particularly the Ar_1 point, that steel will harden when quenched at relatively low temperatures. That property is of particular value when time is lost between the furnace and the quench. Low manganese steel should be normalized or annealed from a temperature of approximately 1650 degrees Fahr. If the section is heavy and the casting is to be given a second heating, the first treatment may be carried somewhat above 1650 degrees Fahr. to break up the as cast structure and completely homogenize the material. Since the first treatment destroys the as cast structure any second treatment may be carried out at a lower temperature, around 1575 degrees Fahr. to give a minimum grain-sized structure. If the casting is quenched, the drawback, which should not be hurried, will depend upon service required.

Research Tests Size of Iron Ore Particles

A series of preliminary tests, conducted by the North Central Experiment station of the bureau of mines, in co-operation with the University of Minnesota, Minneapolis, indicate that the particle size of iron ore in the blast-furnace process is decreased to a greater extent by work applied to the ore than by heat. The ability of coke to maintain its size in the furnace has been fully recognized as being important and tumbler-and-shatter tests have been devised to measure this quality.

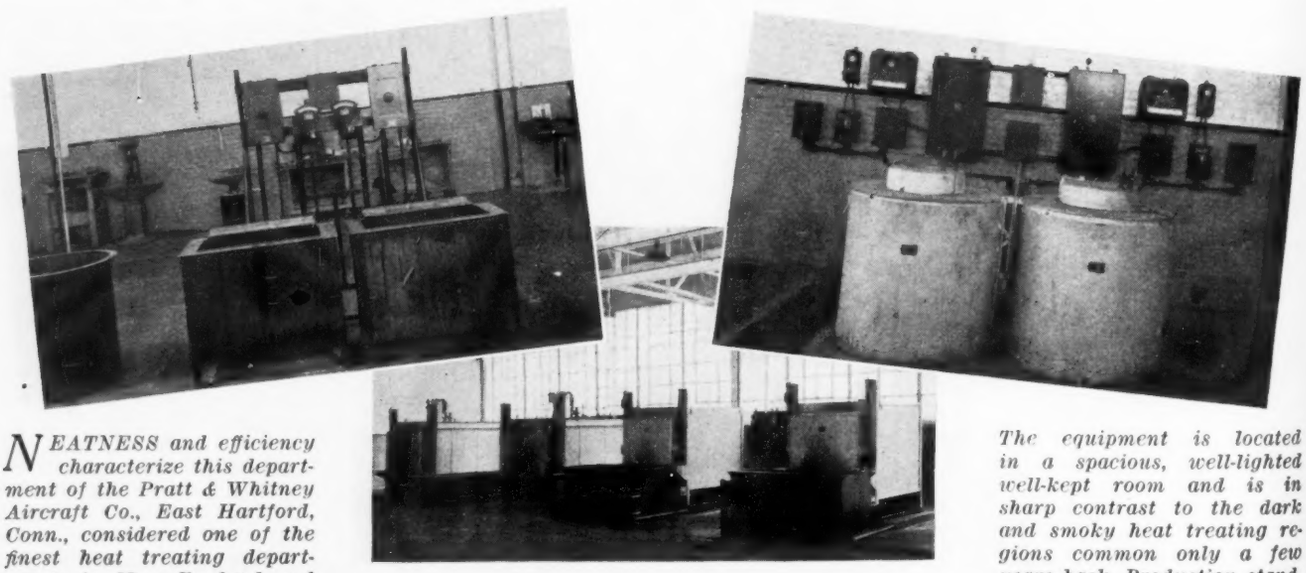
The average particle size decreased 23.6 per cent when samples of iron ore were held in a slowly rotating refractory-lined cylinder for 1½ hours. The average particle size decreased 39.4 per cent when other samples of the same series of ores were brought up to a temperature of 1400 degrees Fahr. in 1½ hours. The latter operation combines the effect of mechanical work and the application of heat. Ores tested varied from hard dense hematites to soft limonites. The decrease in average particle size for various ores varied from 8.7 to 80.1 per cent for cold working and from 8.4 to 83.9 per cent for hot working.

Iron and Steel Institute Is Meeting in Czechoslovakia

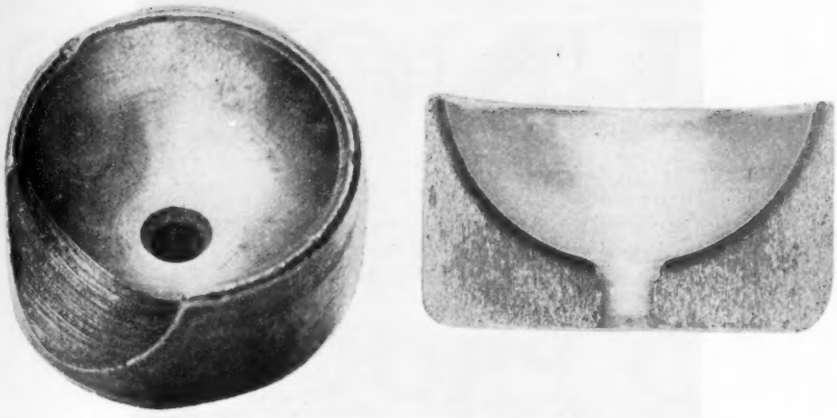
Eleven papers covering a great many phases of the steel industry are scheduled for the autumn meeting of the Iron and Steel institute to be held Sept. 15-20 at Prague, Czechoslovakia. The meeting is under the patronage of the Czechoslovak government, with the support of the Iron and Steel Industrialists of Czechoslovakia. The Society of Czechoslovak Engineers invited the institute to meet in its country. Arrangements include visits and excursions to the principal iron and steel manufacturing and engineering establishments of the country. The complete program of papers is as follows:

"High-Frequency Steel Furnaces," by D. F. Campbell.
"Permanence of Dimensions Under Stress at Elevated Temperatures," by W. H. Hatfield.
"The Heterogeneity of an Ingot Made by the Harmet Process," by A. Kriz.
"A Contribution on the Constitution of the Iron-Carbon-Silicon System," by A. Kriz and F. Poboril.
"A Contribution on the Problem of the Analysis of Basic Slags and the Representation of their Composition in a Triangular Diagram," by O. Quadrat.
"The Magnetometric Determination of the Curie Points," by A. Regner.
"What Reasons Compelled the Prague Ironworks to Introduce Thin-Walled Blast-Furnaces," by J. Sarek.
"The Effect of Contamination by Nitrogen on the Structure of Electric Welds," by L. W. Schuster.
"The Quantitative Analysis of Steels by Spectrum Analysis," by F. Twyman and A. A. Fitch.
"The Mechanism of the Solution of Cementite in Carbon Steel and the Influence of Heterogeneity," by E. Walldow.
"Open-Hearth Furnace Steelworks. A Comparison of British and Continental Installations and Practice," by H. C. Wood.

Model Heat Treating Room Provides Precise Control



NEATNESS and efficiency characterize this department of the Pratt & Whitney Aircraft Co., East Hartford, Conn., considered one of the finest heat treating departments in New England and the country. The installation comprises 10 major electric furnaces, including six carburizing and hardening furnaces, two oil tempering baths, shown in the illustration at the left, and two lead hardening pots, shown at the right. All equipment was furnished by the General Electric Co., Schenectady, N. Y., the total connected load being over 500 kilowatts. The equipment is located in a spacious, well-lighted well-kept room and is in sharp contrast to the dark and smoky heat treating regions common only a few years back. Production standards are maintained with great exactness. Automatic control permits repetition of predetermined cycles. The center illustration shows four box furnaces for general heat treating.



Half of the split bearing for automobile steering mechanism, the inner surface of which is carburized by a selective method (Left). The other illustration is a sectional view of the piece showing the carburized case

Localized Case Hardening Applied to Bearing

SELECTIVE case hardening, a special form of localized heat treating, is practiced on a large scale at the main plant of Thompson Products Inc., Clarkwood road, Cleveland. From 5000 to 10,000 split bearings for automobile steering apparatus use are treated by this process each day at the Thompson plant.

As indicated by the accompanying illustration, the bearings are cylindrical in shape and designed in such a manner that a pair fits about the knuckle arm of the steering mechanism. The wearing surface of each bearing is cupped to accommodate the ball of the knuckle arm, while a throat allows entrance of the arm into the bearings.

Complete hardening of the bearing would result in an inability of the part to withstand impact and shock. However, it is necessary that the wearing surface be able to resist wear of the knuckle ball.

After finish machining, the bearings are copper plated. The plate is removed from the wearing surface, which is to be carburized, by a round cupping tool on a turret lathe. The pieces are next packed in boxes with a carburizing compound and heated in box-type gas-fired furnaces long enough to produce the depth of case desired. The bearings are then hardened in a salt solution at 1425 degrees Fahr. and quenched in brine.

This insures a hard case and excellent wearing surface where the piece has been carburized, permitting the remainder of the bearing to withstand the impacts and shocks to which it is subjected. The cups finally are polished with emery powder, and scleroscopically tested for hardness. Bearings of this type are standard equipment in such cars as Buick, Studebaker, Pierce-Arrow and Graham.

Before subjecting a load of the copper-plated bearings to carburizing treatment, it is practice at the plant to run a few test samples through the process. These are cut in half and inspected to determine whether or not the carbon has penetrated any of the copper-plated area. If so, the entire batch is cleaned and copper plated again.

Convention Calendar

Sept. 15-20—Iron and Steel institute (Great Britain). Autumn meeting in conjunction with the Society of Czecho-Slovakian Engineers at Prague, Czecho-Slovakia. G. C. Lloyd, 28 Victoria street, London, S. W. 1, is secretary.

Sept. 22-26—American Society for Steel Treating. Annual convention and exposition at Hotel Stevens, Chicago. William H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

Sept. 22-26—American Institute of Mining and Metallurgical Engineers. Meeting of iron and steel, and institute of metals divisions at Hotel Stevens, Chicago. Dr. H. Foster Bain, 29 West Thirty-ninth street, New York, is secretary.

Sept. 22-26—American Society of Mechanical Engineers. Meeting of the machine shop practice, and iron and steel divisions at Hotel Stevens, Chicago. Calvin W. Rice, 29 W. Thirty-ninth street, New York, is secretary.

Sept. 22-26—American Welding society. Fall meeting at Congress hotel, Chicago. Miss M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

Sept. 22-26—International Railroad Master Blacksmiths association. Meeting at Hotel Morrison, Chicago.

Sept. 25-27—American Electrochemical society. Fall meeting at Hotel Statler, Detroit. Dr. Colin G. Fink, Columbia university, New York, is secretary.

Sept. 29-Oct. 1—American Gear Manufacturers association. Semiannual meeting at Hotel Clifton, Niagara Falls, Canada. T. W. Owen, 3608 Euclid avenue, Cleveland, is secretary.

Sept. 29-Oct. 4—National Safety council. Nineteenth annual safety conference at William Penn hotel, Pittsburgh. William H. Cameron, Civic Opera building, Chicago, is managing director.

Oct. 8—Gray Iron Institute. Third annual meeting at Hotel Cleveland, Cleveland. Arthur J. Tuscany, Terminal Tower building, Cleveland, is manager.

Oct. 13-17—American Gas association. Annual convention and exhibit at Auditorium, Atlantic City, N. J. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

Oct. 20-22—Concrete Reinforcing Steel institute. Semiannual meeting at Briarcliff lodge, Westchester county, N. Y. M. A. Beeson, 2112 Tribune Tower, Chicago, is secretary.

Oct. 20-23—National Hardware Association of the United States. Annual convention at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 24—American Iron and Steel institute. Semiannual meeting at Hotel Commodore, New York. E. A. S. Clarke, 75 West street, New York, is secretary.

Oct. 24—Rail Steel Bar association. Semiannual meeting at Hotel Commodore, New York. H. P. Bigler, 228 North LaSalle street, Chicago, is secretary.

Oct. 27—American Institute of Steel Construction. Annual meeting at Pinehurst, N. C. Charles F. Abbott, 285 Madison avenue, New York, is secretary.

Oct. 20-23—American Hardware Manufacturers association. Annual meeting at Marlborough-Blenheim hotel, Atlantic City, N. J. Charles F. Rockwell, 342 Madison avenue, New York, is secretary.

Oct. 20-23—Association of Sheet Metal Distributors. Annual meeting at Marlborough-Blenheim hotel, Atlantic City, N. J. George A. Fernley, 505 Arch street, Philadelphia, is secretary.

Oct. 24—American Refractories institute. Fall meeting at Traymore hotel, Atlantic City, N. J. Dorothy A. Texter, 2218 Oliver building, Pittsburgh, is secretary.

The Ontario chapter of the American Society for Steel Treating recently elected the following officers for 1930-31: Chairman, D. M. Frazer, Peerless Engineering Co., Toronto; vice chairman, W. D. Fairbrother, Wallace Barnes Co., Hamilton; secretary, L. F. Fitzpatrick, Flexible Shaft Co. Ltd.; and treasurer, A. G. Davis, Consumers Gas Co., Toronto.

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149 E. Larned St., Detroit, Mich.

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311 Market Street, Shreveport, La.
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Welded Products Co., Inc.
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Welders Supply Company
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1403 Caroline Street, Houston, Texas
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WELDING MACHINES AND WELDING WIRE

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Manganese Steel

Mechanism of the changes which confer special properties on this grade of steel explained by Harry P. Evans, in The Foundry, Sept. 1, 1930, *p.* 102, 1½ *pp.*

When a steel of the pearlitic class is treated to resist abrasion and to develop its maximum ultimate strength, it must be hard and may be somewhat brittle, while manganese steel can be put under the press and straightened without undue fear of breakage. For this reason manganese steel may be used in fairly heavy and intricate sections when the use of a quenched steel of the pearlitic type is questionable. For light castings and also heavier castings where the section is uniform, low manganese steel gives excellent results by merely normalizing with no drawback.

—STEEL 9-11-30

Oil Pumping Equipment

Selection, installation and care of pumping equipment for heavy oils discussed by H. L. Kauffman in Marine Review, September 1930, *p.* 37, 3½ *pp.*, 4 *illusts.*

The advantages and disadvantages of various types of pumps for handling fuel and lubricating oils and similar viscous products are analyzed by the author. Centrifugal pumps are highly efficient for use in pumping light distillates but are not suitable for handling heavy oils. Either the single or the duplex types of steam-driven displacement piston pumps are of low first cost, trouble symptons are diagnosed easily and repairs made readily. For handling heavy oils, rotary pumps should be steam jacketed.

—STEEL 9-11-30

Steel Car Wheels

Development of the modern car wheel outlined by J. F. Miller, in United States Steel Quarterly, Autumn number 1930, *p.* 19.

A solid wrought-steel wheel, which differs from the standard passenger train car wheel in that the rim is 1¼-inch thick instead of 2½ inches, the plate slightly thinner and the hub of smaller diameter, is a recent development. It is known as a single-life wrought steel wheel. Under freight equipment having a maximum capacity of 55 tons or less, this type wheel will give an average service of 150,000 miles.

—STEEL 9-11-30

FABRICATION:

Bridge Erection

Guy-derrick erection of steel bridges and viaducts, described in Engineering News-Record, Aug. 28, 1930, *p.* 318, 6 *pp.*, 15 *illusts.*

Within the past two years a method of adapting the ordinary guy derrick to steel-bridge erection has been so far perfected that two long cantilever structures, a deck-truss bridge and several deck-girder bridges have been successfully erected by this equipment. Its advantages are lightness, low cost, and ability to start the job at any pier. Also it eliminates the conventional traveler, which is usually a costly, special and heavy piece of equipment. The article describes the operation of the guy derrick on actual bridge-fabrication work, and outlines the history and the various advantages of this new method.

—STEEL 9-11-30

Sheet Normalizing Furnace

A newly designed continuous furnace for heat treating steel sheets described in Metallurgia, August 1930, *p* 149, 1½ *pp.*, 4 *illusts.*

Means for transporting the sheets through the furnace and cooling chamber in a vertically postion are provided. Cross section of the furnace has a minimum area which permits of a high velocity of gas with an effective transmission of heat to the steel, the furnace being sealed to maintain a high pressure. The conveyor is arranged so that the sheets are supported by their top edges. The roofs of the furnace, cooling chamber and conveyor are designed and arranged to facilitate their removal for repairs.

—STEEL 9-11-30

Strip Steel Tubing

Technical details of manufacturing tubing from strip steel by the Bundy process discussed by C. H. Peterson in Inco Vol. X, *No.* 1, *p.* 13, 1¼ *pp.*, 2 *illusts.*

The original base metal is received in rolls and is passed through a molten lead-tin bath where it receives a coating on both sides. After wiping and cooling the metal is reeled. After the tube leaves the forming rolls molten metal is poured around the tube. This application of heat sweats the walls together and capillary action draws additional metal in between the walls to fill up any open spots. From this point the tube passes through a water cooler and then is automatically cut to length. Approximately 90 per cent of the automobiles built in this country and Canada employ tubing of this type.

—STEEL 9-11-30

Treating Steel

A new process that promises to increase the efficiency of cutting tools made from carbon and high-speed steel, discussed in Machinery, September, 1930, *p.* 52, 1 *p.*

Little technical information regarding the process is available. Briefly it is known that the treatment consists essentially of a low-temperature preheating of the tools in an enclosed chamber containing a medium or gas. Either gas or electric heat is satisfactory. When the required temperature has been reached, an electric current with a given voltage and amperage is applied to the charge of tools in the furnace. The process, known as Macrome, has been applied successfully to milling cutters, files, broaches, hacksaw blades, mining tools and other tools and parts.

—STEEL 9-11-30

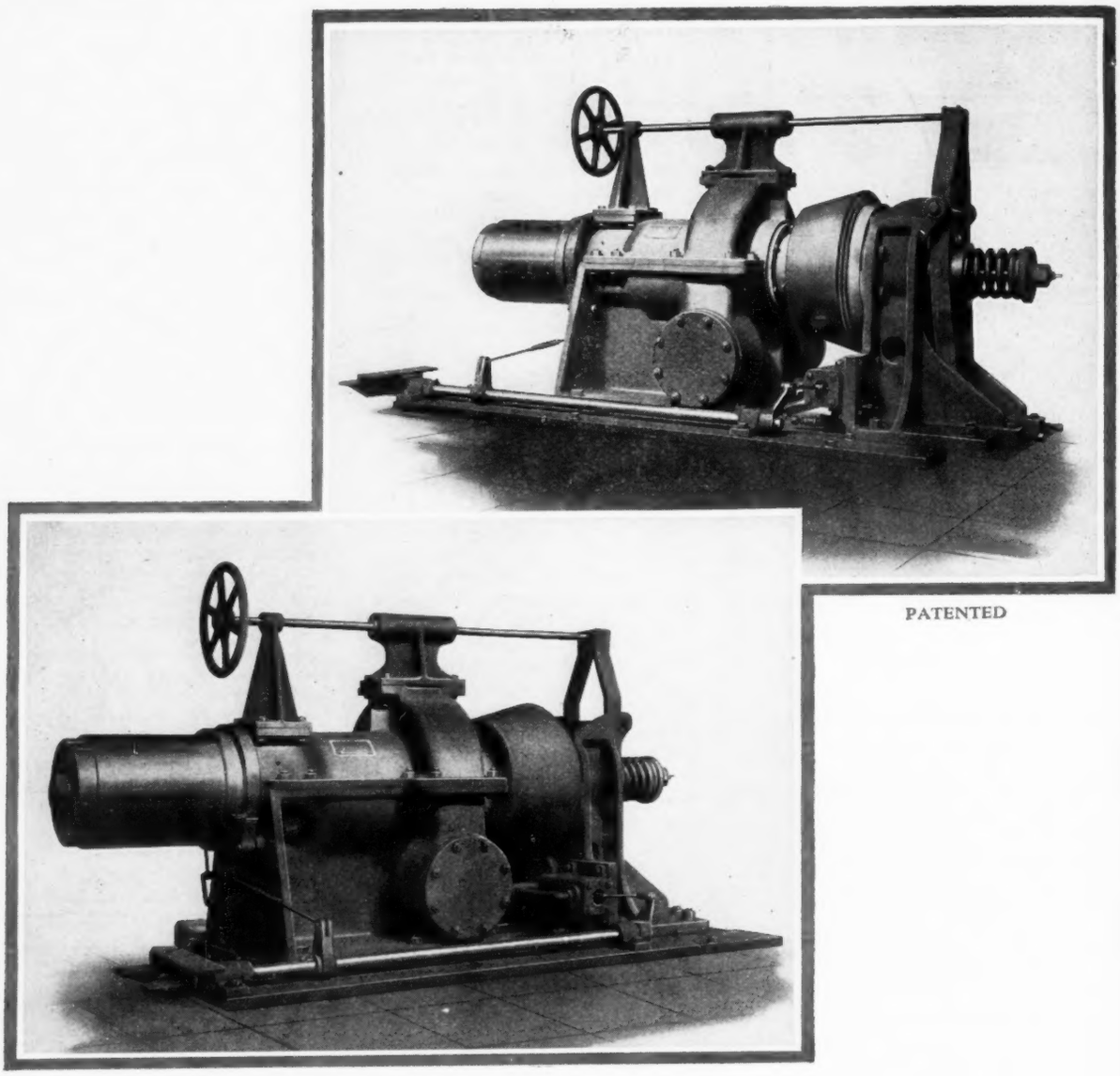
PRODUCTION:

Blast Furnace Charges

Definite information concerning stock distribution and gas-solid contact in the blast furnace by C. C. Furnas and T. L. Joseph. A technical paper, No. 476, *of the bureau of mines, Washington,* 73 *pp.*, 47 *illusts.*, 8 *tables.*

This paper correlates laboratory

UNITED



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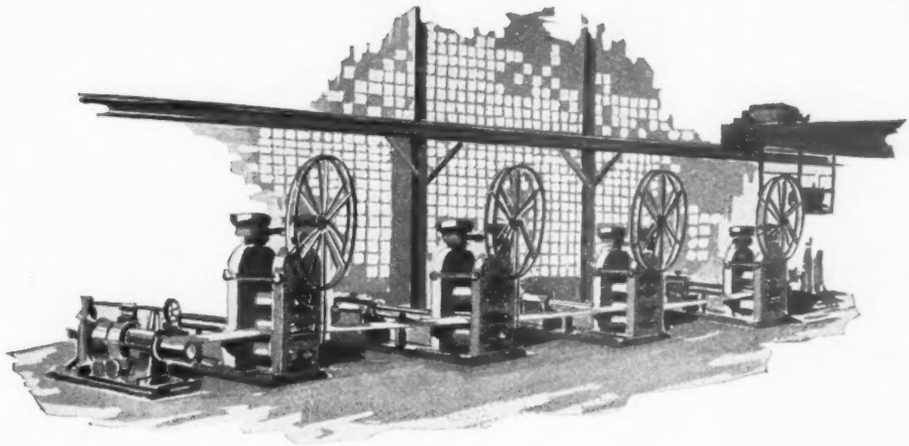
COLD STRIP REELS



This new and improved "UNITED" Motor-Driven Constant Tension cold strip reel, will give various tensions on the strip up to 2500 pounds—keep the tension constant at all times by means of a special electrical control and maintains a smooth chatterless pull throughout the building up process to the finished size of the coil. The tension can be easily adjusted from a light pull to any desired amount up to the maximum capacity. It is arranged to quickly take up the slack in the strip after the coil is entered into the drum.

These features and others particularly desirable in the manufacture of high grade finished materials are embodied in its design. It is entirely self contained with the gears enclosed in an oil tight cast iron case and is equipped with roller bearings throughout. The drum is of the automatic expanding and collapsing, non-marking type. The reel grip is independent of the expanding operation and positively grips both heavy and thin strips.

"UNITED" reels have been specially developed for rapid and convenient operation and are being used today in leading strip mill plants for coiling all commercial widths and gauges of Steel, Copper, Brass, Zinc and other metals.

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and such operating data as are available and presents results of tests made on small models to study the effect of changes in charging upon size distribution at the stockline. Data on some phases of flue-dust production also are presented. Some ideas regarding the most effective means of making favorable changes in size composition of burdens by means of crushing and sintering are outlined.

—STEEL 9-11-30

Blistering of Enamel

The tendency of some cast irons to blister when enameled discussed by A. I. Krynitsky, and W. N. Harrison, in Transactions and Bulletin of the American Foundrymen's association, August 1930, *p.* 332, 8 *illusts.*, 38 *pp.*

The blistering of enamel on cast-iron ware has been a prolific source of trouble, several theories having been advanced to account for it. Gas entrapped in the enamel obviously is the cause, but what causes the generation of the gas has been a disputed point. An investigation of this subject was undertaken and pig irons of various types were melted and castings poured and enameled.

Data accumulated led to several conclusions, the more important being: An enamel may be composed, prepared or applied in such a manner as to cause blisters, irrespective of the character of the iron used; physical defects, especially sponginess, will give rise to blisters; the gases forming blisters are carbon monoxide and carbon dioxide; blistering is quite often due to causes originating in a very thin surface skin called a "micro chill"; there are probably two kinds of nonblistering iron, one with a very small per cent of combined carbon in the surface layer and the other in which cementite is so stable that it takes a relatively long time to break down into ferrite and temper carbon; during the early stages of enameling, both blistering and nonblistering irons evolve gas; addition of graphitizing agents, such as silicon, may be beneficial; and removal of the surface layer by deep sand blasting or "burning out" appears to be the most practical remedy for blistering of sound castings.

—STEEL 9-11-30

Furnace Design

Requirements in the design of open-hearth and electric furnaces discussed by Walter Lister, in Metallurgia, August 1930, *p* 140, 2¾ *pp.*, 8 *illusts.*

The author considers obstructions in gas lines, type of gas valve that offers the least resistance and its advantages, the design of furnace ports and regenerators, and waste-heat boilers at stationary and tilting open-hearths; and designs that improve electric furnace operation.

—STEEL 9-11-30

Iron Ore Beneficiation

Enrichment of the iron content of blast furnace burdens discussed by Ralph H. Sweetser, in Mining and Metallurgy, September 1930, *p.* 423, 4 *pp.*, 1 *illust.*

Spasmodic attempts of sizing coke, ore and limestone have resulted in better blast furnace results. Some large steel companies are putting a maximum limit of ½ to ¾-inch on ores that are crushed and washed. Another step in the refinement of blast furnace practice would be the screening out of the finest ore at the plant and putting the fines through the sintering plant in the first place, instead of putting them into the furnace first and then sending them to the sintering plant as flue dust. The author includes details of the Minnesota School of Mines experiment station.

—STEEL 9-11-30

Pickling Forgings

Valuable suggestions from a practical man on the use of inhibitors, on acid concentration, and on the making of acidity and Baume tests in connection with the pickling of steel forgings, by M. J. Petty, in Black and White, September 1930, *p.* 13, 2½ *pp.*

The author points out in the beginning that, while pickling is an essential process in the forging industry, its development has by no means kept pace with the industry as a whole. Pickling frequently is outside the realm of technical control in shops where efficient control methods are in operation in other departments.

The primary reason for pickling forgings is to remove from forgings the scale which is so injurious to machinery and cutting tools. The action of straight sulphuric acid pickling is to form hydrogen gas beneath the scale by the action between the acid and the iron, the gas acting to push the scale off. Embedded scale presents a more difficult problem, as the prolonged pickling is inclined to form supplementary deposits which are dirty and which encourage rapid rusting.

The author explains this action, and suggests methods of coping with it. He has made analyses of scale on various kinds of steel forgings and from these has worked out scientific formulas for pickling solutions and logical methods of pickling, washing and tumbling. He also emphasizes the importance of proper pickling temperatures.

The conclusion reached is that the pickling department should be by all means under the control of the chemical laboratory. Such control assures properly cleaned work, in a minimum of time and at minimum cost.

—STEEL 9-11-30

MISCELLANEOUS:

Gravity Lubrication

Means employed to maintain a steady supply of oil to various surfaces to be lubricated discussed by H. L. Kauffman, in Machinery, September 1930, *p.* 33, 1¼ *pp.*

Various methods of gravity lubrication including drip-feed, wick-feed and wiper types, and directions for keeping the lubricating means in good condition are explained. With the oil level maintained about ¾-inch below the top of an oil tube, each strand of clean worsted yarn will carry slightly more than one drop of oil a minute.

—STEEL 9-11-30

Wear of Metals

Results of an investigation revealing that oxidation is an essential component in the wear of metals, by Dr. Max Fink, in Transactions of the American Society for Steel Treating, August 1930, *p.* 204, 9 *pp.*, 6 *illusts.*

Wear of metals generally has been considered to consist of the mechanical removal of small particles and cold deformation and hardening under wear conditions. The author of this article, after studying the effect of oxidation, has added what he considers another essential component of wear, this is called wear oxidation.

Various wear tests are described including those conducted in inert atmospheres such as nitrogen. Disks of railroad tire steel were tested in an Amsler wear testing machine. With the wearing process carried out as usual in air one disk showed a loss in weight of 0.18042 gram after 50,000 revolutions. Under identical conditions except that air was excluded and the disks were surrounded with nitrogen, no loss in weight was found after 50,000 revolutions. The theory of wear oxidation is explained.

It is shown that the wear effect of sliding friction can not be compared directly with the effect produced by rolling or with part rolling and part sliding friction. The new theory explains various conditions found in the wear of metals, for instance, the great resistance of nitrided steel is due to the great hardness and to the impossibility of the iron-nitride oxidizing; and corrugation in rails is a result of uneven oxidation caused by vibration.

—STEEL 9-11-30

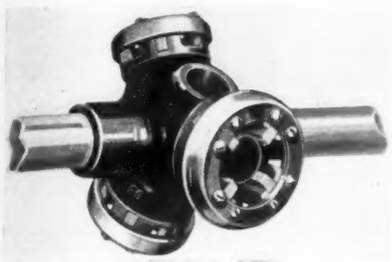
Machine Tools and Plant Equipment

"Without machine tools modern machinery could not be built."

—Joseph W. Roe

Three-Way Die Stock Has Novel Features

Borden Co., Warren, O., announces a three-way die stock in which each die is ready for action immediately, as is indicated by the accompanying illustration. This tool, which is equally serviceable for threading steel, wrought-iron or brass pipe, is of sturdy construction and is designed to be perfectly balanced. The die segments are electrically heat treated for strength and are square shaped. They are not weakened by any shoulder or off-set. The dies are driven by the solid body of the tool and not by a cap held on the body by screws as is the usual practice. The generous design of the body provides easy oiling and plenty of chip clearance.



Three dies are available at once on this one die stock

The die retaining ring is made of pressed steel and tightening of 1/32 of an inch hold the dies rigidly in place. Dies and retaining rings are interchangeable with other die stocks manufactured by this same company, and the dies can be inverted for threading short nipples when required. The body of the tool has extra heavy and extra long handle bosses, so that the handles will not work loose.

◆

Safety Goggle Fits Over Regular Spectacles

Chicago Eye-Shield Co., 2300 Warren avenue, Chicago, Ill., announces an improved safety goggle for workmen engaged on hazardous jobs, who at the same time require the use of corrective spectacles for defective vision. An illustration of this goggle appears herewith.

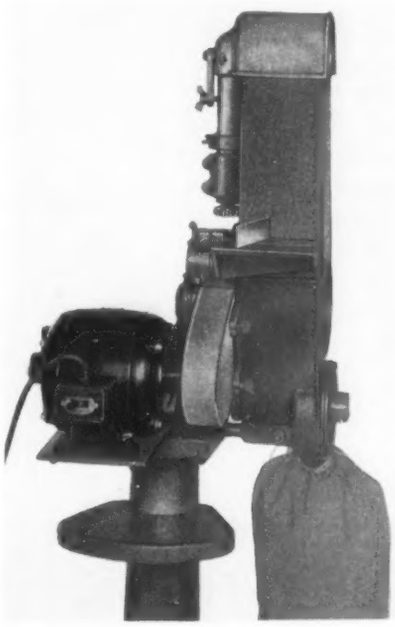
The body of the goggle is molded of composition material, which is light in weight and moisture proof. Although it will fit directly over prescription glasses, protecting both them and the eyes from injury, it is no larger nor heavier than the average industrial goggle.

They are recommended for such operations as grinding, chipping, riveting, caulking and welding, in fact any industrial operation requiring clear vision and eye safety.

◆

Belt Sander and Grinder Has Numerous Uses

Porter-Cable Machine Co., Syracuse, N. Y., has brought out a sanding and grinding machine designed to put a straight grain finish on various materials including metal, wood, fiber, bone, celluloid, bakelite, etc. Some of the applications are; cleaning up cast ings, removing burrs, grinding bearings caps, replacing light milling operations, and sharpening tools. The accompanying illustration shows the machine set up and ready to run, with its grinding belt set in vertical position and dust bag in place.



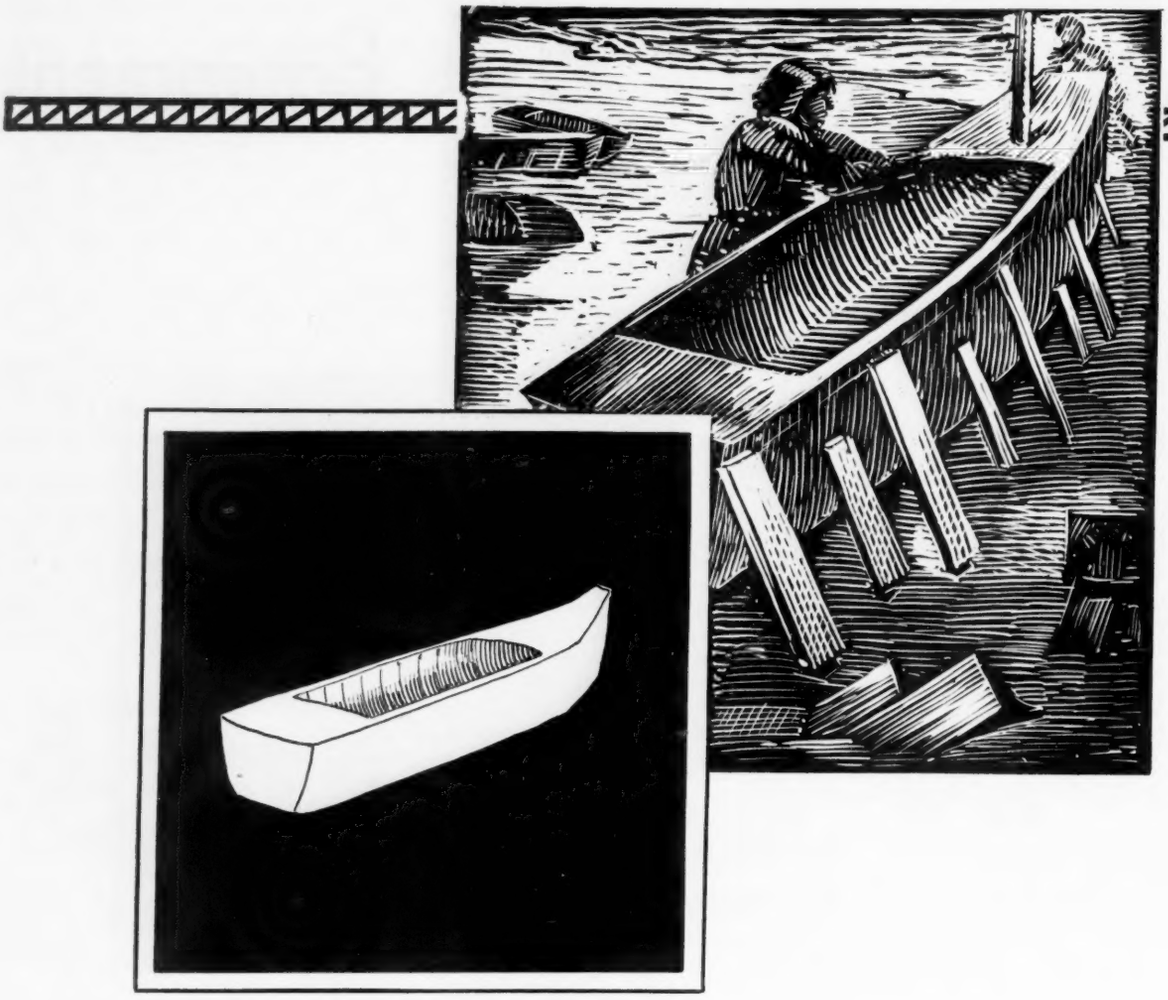
The abrasive belt can be set either vertically or horizontally

The grinding head is driven by a V-belt from the motor to a sheave attached to the drive pulley of the grinding belt, two speeds being provided. The motor weight acts as an automatic take-up on the belt. One of the interesting features of the machine is the built-in vacuum dust collecting system. Abrasive belts in this machine are easily and quickly changed without removing the guard or the idler pulley. Breaking of the edge of the belt or cutting of the frame of the machine is prevented by an automatic guide which keeps the belt from running wild.

Safety goggles allow glasses to be worn under them

The grinding head can be used either in a vertical or in a horizontal position, as the work requires. When using the machine in horizontal position an edging guide is provided which clamps in place on the table. By using this guide, long work can be handled and square faces are sured. The sanding or grinding bed can be adjusted in and out to give the correct surface tension to the belt and to allow the use of a felt cover for flexibility, or it can be removed entirely for slack belt sanding. Compound angles can be secured quickly by a tilting table which is graduated 45 degrees up and down.

The machine is equipped throughout with dustproof ball bearings lubricated through pressure fittings. A 1-horsepower motor is used which runs at 1725 revolutions per minute, giving belt speeds of 3000 and 4000 feet per minute. The abrasive belt is 6 inches wide and 54½ inches long. The machine can be furnished either as a bench type or mounted on a ped-



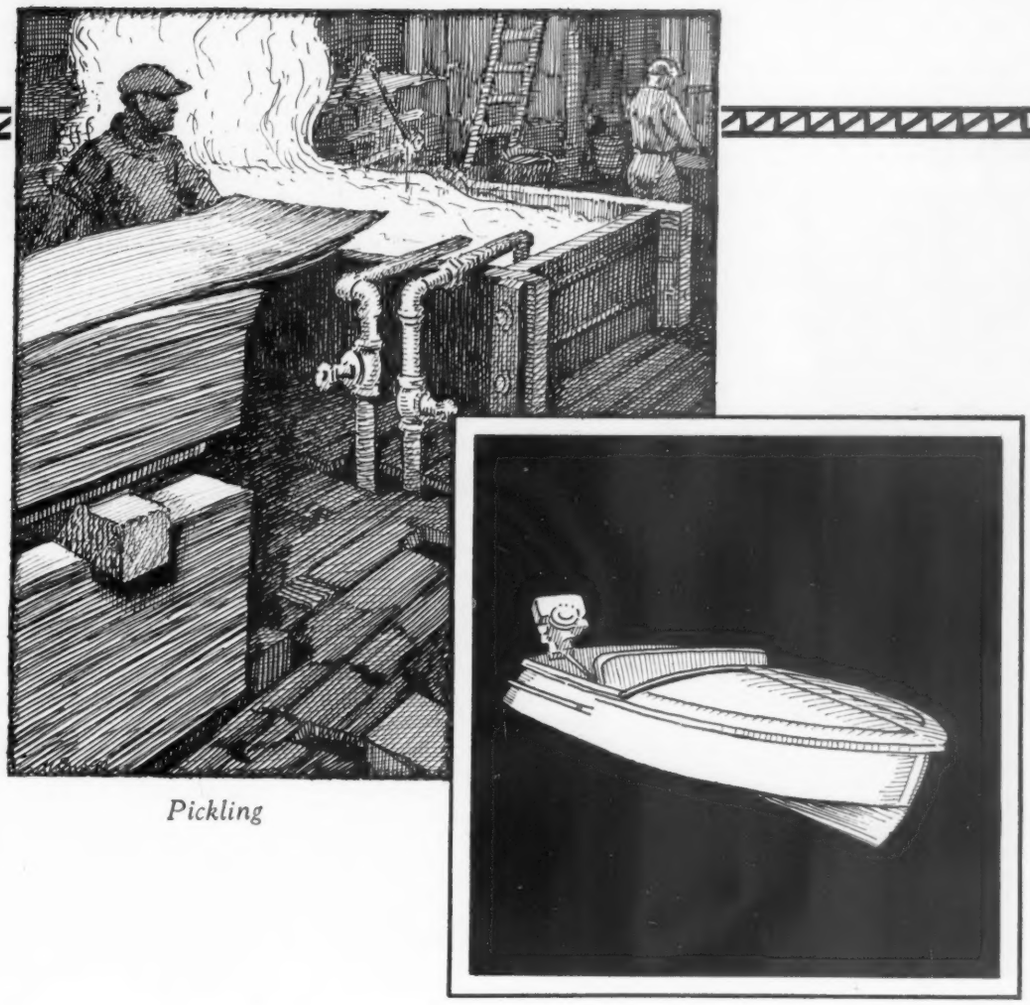
Guild Ideal of Doing One Thing Well Now Ke

History records that early in mediaeval times it was a recognized fact that it was best to do one thing well. In 1363 craftsmen were by law required to stick to one guild. Apprentices were accepted for but one craft and were prohibited by law from following no other work excepting that to which they had been apprenticed. Thus began the idea of specialization six centuries ago. Six hundred years experience has served to emphasize the importance and worth of this idea of doing one thing well—specialization.

Black Sheets
Automobile Sheets
Metal Furniture Sheets
Ceiling Stock
Locker Stock—Regular and Special
Japanning Stock—Regular and Special
Single Pickled Sheets
Bow Socket Sheets
Milk Can Stock

EMPIRE STEEL SHEETS

EMPIRE



Pickling

Now Kept Alive by Empire Steel Specialization

Enameling Stock
Auto License Plate Stock
Nickel Plating Stock
Full Pickled Sheets
Electrical Sheets
Copper Bearing Sheets in all Finishes
"Wabik" Metal — (Special Vitreous Enameling Stock)

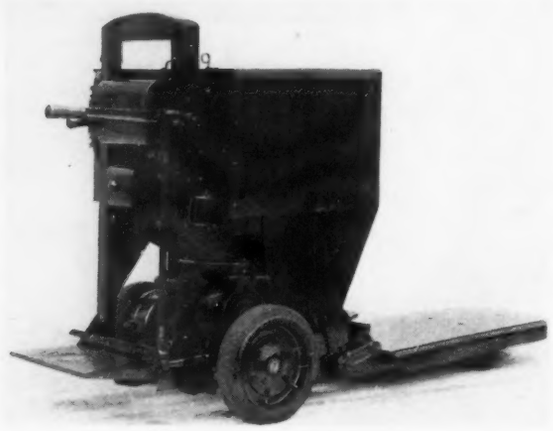
Fully realizing the advantages of specialization, Empire Steel Corporation has steadfastly refrained from the temptation to manufacture anything but the one special line. Undivided attention is devoted solely to the manufacture of steel sheets. It stands to reason that this concentration has made possible a superior product which merits your consideration.

EMPIRE STEEL CORPORATION

Mansfield, Ohio

Sales Offices: New York-Philadelphia-Cleveland-Detroit Chicago, 520 No. Michigan Ave.—Indianapolis—St. Louis

Steel Sheets



Ordinary hand truck platforms 7 inches or over in height can be lifted and conveyed by this medium size electric truck, operating cost of which is low

estal, the net weight with pedestal being 350 pounds.

◆

Welding Rod Is Made for Various Conditions

Wilson Welder & Metals Co. Inc., North Bergen, N. J., has introduced a complete line of general purpose arc welding rod, a grade being available for various metals and for different welding conditions. The manufacturer claims for this wire rapid and smooth flowing qualities, good penetration, and ability to make welds of at least 50,000 pounds per square inch tensile strength. It is supplied in 50-pound, wire-tied, burlap wrapped bundles.

◆

Power Lift Truck Handles Hand Truck Platforms

Crescent Truck Co., Lebanon, Pa., announces a new type of electric industrial truck of the power-lift variety, designed to handle hand truck platform skids 7 inches high or over. This truck, shown in the accompanying illustration, fits into the field between the large, heavy industrial trucks and the ordinary hand lift trucks. It has two speeds forward and two speeds in reverse, and the foot brake pedal interlocks with the control mechanism. All main bearings are of the ball or tapered roller type, and other bearings are bronze bushed with pressure lubrication.

The driving unit is suspended on cantilever springs, rubber tires are used on all four wheels, the underneath clearance is 3 inches, and the machine will give 3¼-inch lift. The drive is through spur gears with a reduction of 19 to 1, and separate motors are used for driving and elevating.

The overall length of the truck is 88 inches, overall width, 33 inches, the lifting platform is 20 x 40 inches, and the turning radius is 7 feet. The capacity of the machine is 3500 pounds. The manufacturers point out that the operating charges on this truck are extremely low, being 18.00c an hour—this including depreciation, interest on investment, repairs, maintenance, battery replacement, everything in fact but the operator's wages.

◆

New Switchboard Details Save Much Space

General Electric Co., Schenectady, N. Y., announces a new line of potential and synchronizing plugs and receptacles for use on industrial switchboards. These are designed so that less space is required in mounting and the appearance of the front of the switchboard is improved.

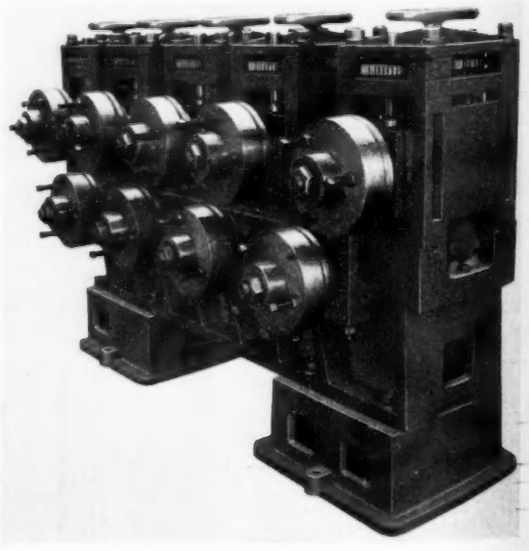
In these new devices, insulating material covers the front ends of the contacts, which is a departure from older practice. A reduction is also brought about in the spacing of the receptacles, thereby permitting a larger number of different circuits to be brought to a panel within a given area on the switchboard. At the same time interchangeability of plugs is prevented.

◆

Improved Straightener Has Adjustable Centers

Sutton Engineering Co., Park building, Pittsburgh, has brought out a new bar straightening machine, illustration of which accompanies this description, which has a capacity for straightening angles up to 6 x 6 x ½ inch, rails up to 60 pounds, and flats up to 6 x 1 inch. In addition it will handle all other sections of not over the same weight per foot as the above, and will handle flats down to 1½ x ¼ inch or other sections of not less than this weight per foot. The important feature of this machine is that the straightening centers can be varied to suit bars from the minimum to maximum sizes, which permits perfect straightening to be accomplished in every case.

This straightener is equipped throughout with tapered roller bearings, and all of its gears are enclosed and run in oil. It is arranged for motor drive, although the electrical equipment is not furnished with the machine. A 75-horsepower motor running at 500 revolutions per minute is recommended. One set of rolls, grooved as desired, comes with the machine and additional sets can be furnished extra to suit any section. The approximate weight of the machine is 53,000 pounds. It occupies floor space of 10½ x 12 feet.



Adjustable center distances between rolls to suit them to every shape and weight of stock within its capacity, is a notable feature of this sturdy bar straightening machine

See More Signs Market Is Turning

Further Gains in Ingot Output, Plans for Stabilizing Prices, Brisk Shape Demand Hearten Mills—Iron More Active—Oil Country Takes Plates

SEPTEMBER'S apparent extension of August's 5½ per cent increase in steel production, the determination of producers of heavy products as well as of sheets and strip to stabilize prices, and continued heavy inquiry for and buying of structural material tangibly support the belief that the market situation in steel is improving.

The industry does not look for a precipitate recovery, and whether the current betterment assumes greater proportions than a normal fall upturn remains to be seen; nevertheless, the conviction is widespread that the industry has turned the corner and is now facing forward.

A firmer attitude on price, which is regarded as highly significant, is designed chiefly to terminate disturbing irregularities, improve the technical position of producers and put them in position to return to remunerative levels when noteworthy business returns. The effect on profits for the fourth quarter will be mild, as many low-priced contracts will be carried over.

An important producer's minimum of 1.60c, Pittsburgh, on bars, plates and shapes may foreshadow the stand on these products. Birmingham mills have lowered heavy steel $1, bringing it in line with Pittsburgh, the same motive prompting a $1 reduction in hot strip at Chicago. Wire nails are more generally $2 to jobbers. Present levels on nuts, bolts and rivets have been extended into the fourth quarter.

Most mills now quote 2.45c, Pittsburgh, on black sheets, 3.10c on galvanized, 3.60c on autobody, 2.00c on blue annealed plates and 2.15c on blue annealed sheets. Fourth-quarter prices named by a Chicago mill generally represent $1 increases. Chicago warehouses have lowered black and galvanized sheets $5.

Well over 100,000 tons of active structural inquiry is before fabricators, much of it apparently to be placed shortly. Kentucky is closing on 22,000 tons for bridges, an office building at Boston requires 19,000 tons, highway bridges in New Jersey specify 15,900 tons, New York subways call for 5100 tons. Railroad terminal work at St. Louis includes 5000 tons, while grade crossing elimination programs of the Erie, Monon and Nickel Plate at Chicago will demand tonnages. The week's awards, at 47,615 tons, compare with 46,255 tons last week and 20,717 tons a year ago.

Though the season is not conducive to railroad purchasing, the placing of 305 freight cars by the Lehigh & New England, 115 by the Mexican state railways and 50 by the New York Central lends a semblance of activity. August orders for freight cars totaled 1070, compared with 1348 in July and 2854 last August. Eight-month car orders for 1930 are 35,022; for 1929, 66,011, Reading is placing 30,000 tons of rails with two eastern makers.

Oil country orders are accruing to plate mills. Gulf Refining Co. has bought 4000 tons for tanks in connection with its new pipeline. New storage tank inquiry at Chicago, amounting to 6000 tons, makes 20,000 tons on inquiry there.

Pig iron evidences a quickening both in sales and inquiry in many districts, but accompanied by further price weakness. A 50-cent reduction at Cleveland brings the market there to $17.50. Silvery iron and bessemer ferrosilicon have been cut as much as $7.

August's daily ingot rate of 119,050 gross tons is more important for its trend than its volume. Over the 112,823 tons of July this was a gain of 5.5 per cent, the first improvement since February. For eight months of 1930 steel output has been 29,821,891 tons, against 38,825,943 tons a year ago.

Youngstown steel mills this week average 58 to 59 per cent, against 57 last week. Chicago mills at 57 per cent are up 2 points. Cleveland operations have snapped up from 27 to 41 per cent. Pittsburgh is holding at 55 per cent. Buffalo has slipped back to 48 per cent, the lowest of the year. Steel corporation subsidiaries this week are at 66-68 per cent, a slight gain.

Softness in pig iron and nails is principally responsible for another 10-cent decline in STEEL'S market composite, now at $32.68.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Sept. 10, 1930)	**$32.68**
Last week (Sept. 3, 1930)	**32.78**
One month ago (August, 1930)	**32.99**
Three months ago (June, 1930)	**33.53**
One year ago (Sept. 1929)	**36.50**
Ten years ago (Sept. 1920)	**69.28**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Sept. 10, 1930	Aug. 1930	June 1930	Sept. 1929
PIG IRON				
Bessemer, del. Pittsburgh	$20.26	20.26	20.76	20.76
Basic, valley	18.00	18.00	18.50	18.50
Basic, eastern del. eastern Pa.	18.25	18.00	18.75	19.85
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.76	19.76
No. 2 foundry, Chicago	17.50	17.50	18.40	20.00
*Southern No. 2. Birmingham	14.00	14.00	14.00	14.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	20.00
**No. 2X, Eastern del. Phila.	19.76	19.76	20.26	22.26
Malleable, valley	18.50	18.50	19.00	19.00
Malleable, Chicago	17.50	17.50	18.40	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	18.63	18.63	19.13	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.60	2.50	2.50	2.65
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	31.00	31.00	31.25	35.00
Sheet bars, open-hearth, Pitts.	31.00	31.00	31.25	35.00
Billets, open-hearth, Pittsburgh	31.00	31.00	31.25	35.00
Wire rods, Pittsburgh	36.00	36.00	36.00	42.00

	Sept. 10, 1930	Aug. 1930	June 1930	Sept. 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.65	1.65	1.75	1.95
Steel bars, Chicago	1.75	1.75	1.85	2.05
Steel bars, Philadelphia	1.94	1.94	2.04	2.27
Iron bars, Chicago	1.75	1.80	1.90	2.05
Shapes, Pittsburgh	1.60	1.64	1.70	1.95
Shapes, Philadelphia	1.66½	1.67	1.77	2.06
Shapes, Chicago	1.75	1.75	1.80	2.05
Tank plates, Pittsburgh	1.60	1.64	1.70	1.95
Tank plates, Philadelphia	1.80½	1.81	1.91	2.15
Tank plates, Chicago	1.75	1.75	1.80	2.05
Sheets, blue anl., No. 13, Pitts.	2.15	2.15	2.15	2.85
Sheets, black, No. 24, Pitts.	2.45	2.47	2.55	2.35
Sheets, gal., No. 24, Pittsburgh	3.00	3.09	3.20	3.50
Sheets, black, No. 24, Chicago	2.60	2.60	2.70	3.10
Sheets, blue anl., No. 13, Chicago	2.30	2.30	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.20	3.20	3.30	3.75
Plain wire, Pittsburgh	2.30	2.30	2.30	2.45
Wire nails, Pittsburgh	2.00	2.05	2.15	2.50
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pitts.	15.75	15.19	15.10	18.45
Heavy melting steel, eastern Pa.	12.75	12.50	13.25	16.38
Heavy melting steel, Chicago	12.25	12.00	12.05	15.05
No. 1 wrought, eastern Pa.	14.25	14.25	15.25	16.13
No. 1 wrought, Chicago	11.25	11.25	11.50	15.70
Rails for rolling, Chicago	14.50	14.50	14.55	17.60

Sheets

Mills Making Effort to Establish Higher Prices for Fourth Quarter—Sales Light

SHEET PRICES, PAGE 85

Pittsburgh—Improvement in the sheet market is confined to increased interest in contracts, incoming tonnage showing little change from that of recent weeks. With mills seeking to eliminate recent shading through the reaffirmation of former prices, in the belief that demand has touched bottom, consumers are taking slightly more interest in future tonnages. Prices named on current business are 2.45c for black sheets, 3.10c for galvanized, 2.00c for blue annealed plates, 2.15c for blue annealed sheets and 3.60c for autobody. Books have not been officially opened for fourth quarter, although delivery of some tonnage that is being booked will extend into that period.

New York—Sheet prices are stronger. Some sellers have announced a flat price of 2.45c, Pittsburgh, for black sheets; 2.00c for blue annealed plates, and 2.15c for blue annealed sheets. They are quoting galvanized sheets at 3.00c, Pittsburgh, to the jobbing trade, and 3.10c, to the merchant trade; and have firmed up on furniture sheets, now quoting 3.70c, Pittsburgh. These prices, effective at once, are expected to apply on business throughout the remainder of this year.

Philadelphia—Sheet mills show a firmer attitude on prices and low figures have been withdrawn in some instances. Demand continues about the same as in August. The radio industry is consuming fair tonnages and orders from the automotive industry in this district have improved slightly.

Youngstown, O.—An increase in specifications for black and galvanized sheets has brought the rate of mill operations this week to around 50 per cent. Makers of autobody sheets are disappointed at the small volume of business. Prices hold at 2.45c, base, Pittsburgh, for black, 3.10c for galvanized; 2.00c to 2.15c for blue annealed, and 3.60c for autobody.

Cleveland—Sheet orders continue to expand. More autobody sheets have been released by the Fisher Body Co. and other users. Fisher Body is ordering material for six weeks ahead. Sheet orders for building purposes are active. One large order for shipment to South America went to a Youngstown, O., mill. Several carloads of building sheets are to be bought this week by the Cleveland board of education. Not all manufacturers are observing the new extra of 35c for drawing stock, which makers planned to substitute for the 25-cent and 50-cent extras for deep drawing and extra deep drawing, respectively.

Chicago—Sheet mill operations are about 60 per cent for the district. Tonnage is not improving and buyers continue to hammer at prices. Implement demands are light. The Inland Steel Co. has tentatively named fourth quarter prices which practically are a reaffirmation of present prices, except that the quotation for galvanized represents an advance of $1 a ton. The price of black sheets also is $1 higher than some quoted recently in the West.

Cincinnati—Sheet mills in this district continue production at slightly less than 50 per cent. Prices announced for fourth quarter are: No. 24 black sheets 2.45c; No. 24 galvanized 3.10c; autobody 3.60c; No. 10 blue annealed 2.00c, and No. 13 blue annealed 2.15c, base, Pittsburgh.

Buffalo—Demand for sheets is again at low ebb and district producers are operating at only 50 per cent. The September outlook is not particularly bright.

St. Louis—Seasonal requirements for some grades of sheets have improved slightly. Specifications for autobody sheets also have increased.

Birmingham, Ala.—Sheet production continues at 50 per cent of capacity. Gulf States Steel Co., now shipping galvanized sheets, reports the market has a better tone.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.45c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.69c to 2.74c
Gary, Indiana Harbor	2.55c
Chicago, delivered	2.60c
Birmingham, base	2.60c to 2.65c
St. Louis, del.	1.80½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.70c to 2.80c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.00c to 3.10c
Philadelphia, delivered	3.29c to 3.39c
Gary Indiana Harbor	3.15c to 3.20c
Chicago, delivered	3.20c to 3.25c
Birmingham base	3.25c to 3.30c
St. Louis, del.	3.45½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.15c
Chicago, district mills	2.25c
Chicago, delivered	2.30c
St. Louis, delivered	2.50½c
Philadelphia, delivered	2.34c to 2.44c
Birmingham	2.30c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	2.00c
Chicago, district mills	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.19c to 2.29c
St. Louis, delivered	2.35½c
Birmingham	2.15c

AUTOMOBILE NO. 20

Pittsburgh, base	3.60c
Detroit, delivered	3.86½c

FURNITURE NO. 24

Pittsburgh	3.60c to 3.70c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, 24, primes	3.55c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$2.00 and 2.10
Cement coated nails	2.00 and 2.10
Galvanized nails	4.00 and 4.10

(Per pound)

Polished staples	2.50c and 2.60c
Galvanized staples	2.75c and 2.85c
Barbed wire, gal.	2.70c and 2.80c
Annealed fence wire	2.20c and 2.30c
Galvanized wire	2.65c and 2.75c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts-Cleve.	2.75c
Struc. c.l., Chicago	2.85c

**7/16-inch and smaller.

Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c
Philadelphia, del.	1.80½c
New York, del.	1.88c
Boston, del.	2.05c
Chicago, base	1.75c
Cleveland, delivered	1.78½c to 1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.80c to 1.85c
Coatesville, Pa., base	1.70c
Pacific Coast, c.i.f.	2.15c to 2.25c
St. Louis, del.	2.00½c

Structural Shapes

Base, Pittsburgh	1.60c
Philadelphia, del.	1.66½c to 1.70½c
New York, del.	1.75½c to 1.85½c
Boston, del.	1.88½c to 1.98½c
Chicago, base	1.75c
Cleveland, delivered	1.83½c to 1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.80c to 1.85c
Pacific Coast, c.i.f.	2.25c
Detroit, del.	1.91½c to 1.96½c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.75c
Birmingham, base	1.80c to 1.85c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.35c
Cleve. base, local del.	1.70c
Do, outside delivery	1.65c
Philadelphia, del.	1.94c
New York, delivered	1.98c
Boston, delivered	2.05c
Pittsburgh, cold finish	1.80c
Pittsburgh, forg. qual.	1.90c

RAIL STEEL

Chicago Heights	1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c to 1.85c
New York, delivered	1.93c to 1.98c
Philadelphia, delivered	1.94c to 1.99c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet, over 500 tons	1.85c
30 to 200 tons	2.00c
Under 30 tons	2.45c to 2.85c
Chi., rail steel, over 30 tons	1.50c
Under 30 tons	2.10c to 2.50c
Philadelphia, cut lengths	2.04c to 2.09c

Cold-Finished Steel

Bars, Pitts., Chi., Buff., Cleveland	2.10c
Do. delivered, Detroit	2.20c
Shafting (turned, polished) Pitts., Buffalo	2.10c
Do. (turn., ground) mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets 35c; plates 31c; bars 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80-1.10 Cr.	0.45
2300	1.50	5100 Chr. spring.	0.20
2500	2.25	6100 Bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Chr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.20	9250 (flats)	0.25
4100 .15 to .25 Mo.	0.50	9250 (rds., sq.)	0.50
4600 .20-.30 Mo.			

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.75c
Hot strip 6 1/16 to 24-in., Pitts.	1.65c
Hot strip, bands 6 in. and under, Chicago	1.85c
Do. 6 1/16 to 25 in.	1.75c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do. Chicago	2.00c to 2.10c
Cold rolled strip., Pitts., Cleve., 3 tons, over	2.35c to 2.45c
Worcester, 3 tons, over	2.60c to 2.70c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts.	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930 lists.

CARRIAGE BOLTS

All sizes, cut thread	73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list	73 off

MACHINE BOLTS

All sizes cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	73 off
Tire bolts	60, 10 and 10 off
Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 10, 5, 2½ off in bulk.	
Rolled thread machine bolts, ⅜ x 6 and smaller take 10 per cent lower list.	

NUTS

Semifinished	73 off

***HEXAGON CAP SCREWS**

Milled	80-10-5 off
Upset 1 in. diam. and smaller	85-10 off

***SQUARE HEAD SET SCREWS**

Milled	85-5 off
Upset 1 in. and smaller	80-10-5 off

*Discounts dated Jan. 23, 1930.

Cut Nails, Chain, Piling

Cut nails, c.l., mills	2.45c
Do, less carloads	2.55c
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	2.00c

Bars

Specifications Slow but Releases Are Heavier — Sellers Seek To Establish Price Firmness

BAR PRICES, PAGE 85

Chicago—Releases of bar mill products are a shade heavier, and occasional orders are placed for part or all of fourth quarter. Outlook continues favorable, despite conservative gains in specifications. Mills are willing to take fourth-quarter tonnage whenever it is offered, although they have made no formal announcement of the opening of books. Bar mill operations are about 60 to 65 per cent, deliveries prompt. The large automotive parts makers in this district are planning October-November schedules with a view to slightly heavier orders from the Detroit district. Concessions below the 1.75c, Chicago, base price for bars, plates and shapes have been made, even to small-lot buyers who take their purchases by truck at the mill doors, but producers seek to hold quotations from further general decline.

New York—While shading is still noted, the market on commercial steel bars continues at 1.65c, Pittsburgh. Trading is slightly more active with improved inquiry from drop forging interests.

Pittsburgh—Little further improvement is noted in steel bar demand. Automotive requirements still lag and cold bar finishers have not increased their tonnages materially. Some talk is heard of a possible stiffening in prices by fourth quarter but definite announcement is lacking. Difficulty is experienced in maintaining a $1 differential over plates and shapes and though 1.65c is regarded as the market for bars 1.60c is heard occasionally on larger lots.

Philadelphia—Demand for steel bars continues dull, the general market continuing 1.65c, Pittsburgh, although lower is being done.

Cleveland—Demand for carbon bars shows little variation. Excluding Labor Day, September to date for some producers equals the like period of last year. Automotive forgers display a little more interest. Producers are hopeful that the last half of this month will develop improvement. Carbon bars for local delivery are usually 1.70c, base, Cleveland, and for outside delivery, 1.65c, base, Cleveland.

Will Supply Steel Strand

New York—American Steel & Wire Co. has been awarded a contract for 240,000 feet of ⅜-inch steel strand for the United States Engineers, Kansas City, Mo.

Cold Finishers Note Orders More Numerous

Cold Finished Prices, Page 85

Pittsburgh—Demand for cold-finished steel bars is holding at the improved rate of recent weeks. Automotive requirements are slow to expand and remain seasonally light but there has been a moderate expansion in requirements of miscellaneous consumers. Producers as yet have not opened books for fourth quarter and inquiry is light. The 2.10c price is named on current tonnage and still is most representative of going business.

Cleveland—Cold bar finishers are receiving more numerous orders, although there seems to be no disposition yet to order ahead. Quantities in specifications are small and for immediate wants, hence quick shipments are asked. The 2.10c, Cleveland, price holds on tonnages being placed.

Will Add Open Hearth

St. Louis—St. Louis Screw & Bolt Co. will install a 40-ton open-hearth steel furnace, to be in operation Jan. 1, according to the Industrial Club of St. Louis.

Plates

Tank Requirements Increase to 20,000 Tons—Market in Middle West Is Easier

PLATE PRICES, PAGE 85

Chicago—Storage tank tonnage from the oil fields is promising. About 6000 tons in new inquiry have appeared, making 18,000 to 20,000 tons pending. Pipe line work will take plate shipments at the present rate for probably 60 days. One producer has his plate capacity fully engaged, while the district's operations are about 85 per cent. About 1500 tons of plates have been let for an intake tunnel at East Chicago, Ind. Concessions to 1.70c and 1.65c, Chicago, have been made in the last ten days, although mills apparently are anxious to re-establish 1.75c for fourth quarter, for which some business is being taken.

New York—Early award of a government airplane carrier requiring close to 7000 tons of plates is expected. The Newport News Shipbuilding & Dry Dock Co. is low bidder. A fire boat for New York requiring 150 tons of plates is expected to come up for bids again shortly. Tank and pipe work is light. Detroit will open bids Sept. 16 on 600 tons of 36-inch pipe. A small tonnage of 66 and 84-inch pipe is being figured here for the Mahoning county commission, Youngstown, O. The market is unchanged at 1.70c, Coatesville, subject to concessions on certain preferred tonnage.

Pittsburgh—Plates continue quiet but incoming tonnage is steady. Tank work is confined largely to new construction for the Gulf Refining Co. Twelve tanks involving 4000 tons have been placed for use in connection with the pipe line to be laid from Oklahoma to Pittsburgh, while additional tonnage is in prospect for new refineries at Cincinnati, Pittsburgh and Toledo. The barge market is devoid of inquiries or awards. Plate requirements of car builders are light, but this deficiency is offset to a certain extent by demands of lapweld pipe mills. Producers intend to hold the market to 1.60c.

Philadelphia—Demand for plates continue quiet, eastern mills operating at an average of 40 to 50 per cent. The price is unchanged at 1.70c, base, Coatesville, subject to occasional differentials on certain classes of tonnage.

Cleveland—Plate tonnage is meager. One producer operates its two mills alternately as tonnage accumulates in two size ranges. Demand is diversified, with tank plates leading. For ship repairs 1000 tons are to be bought. Plates are 1.60c, Pittsburgh, with little moving at the latter figure.

Contracts Placed

4000 tons, 12 tanks for Gulf Refining Co., pipe line from Oklahoma to Pittsburgh, to McClintic-Marshall Co., Pittsburgh.

100 tons, 500,000-gallon elevated steel

water storage tank, Green Bay water department, Green Bay, Wis., to cost $30,300, to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa.

100 tons or more, storage tanks and treating cylinder, Vancouver Creosoting Co., Vancouver, B. C., to Vulcan Iron Works and Vancouver Engineering Works, Ltd., Vancouver.

Contracts Pending

7000 tons, government airplane carrier, Newport News Shipbuilding & Dry Dock Co., Newport News, Va., low on general contract.

600 tons, 36-inch steel pipe, Detroit, bids Sept. 16.

Iron Ore Receipts Down; Dock Balance Higher

Iron Ore Prices, Page 96

Cleveland—Further demand for iron ore in the open market is lacking, and the sole interest of producers now is to get to consumers tonnages previously contracted. Receipts at Lake Erie ports and shipments therefrom for the season to Sept. 1 are reported by the Lake Superior Iron Ore association as follows:

Port	Receipts	Shipments	Dock Balance Sept. 1, 1930
Buffalo	2,274,802	140,380	3,042
Erie	515,783	577,711	64,598
Conneaut	5,158,860	4,972,814	1,798,262
Ashtabula	3,953,905	3,682,070	1,800,050
Fairport	1,373,761	1,298,906	427,015
Cleveland	5,035,065	3,454,547	981,173
Lorain	1,681,370	652,510	119,655
Huron	733,980	774,669	321,796
Toledo	955,781	632,404	25,185
Total	21,683,307	16,186,011	5,540,776
Comparative 1 yr. ago	29,956,346	22,395,864	5,110,516

Receipts at other ports were as follows:

Port	Tons
Detroit	630,069
Indiana Harbor	1,626,003
Gary	2,757,395
South Chicago	4,200,748
Sault Ste. Marie, Ont.	335,025
Point Edward, Ont.	255,183
Total	9,804,423
Comparative 1 year ago	12,129,268

Tin Plate Demand Steady; Larger Output Scheduled

Tin Plate Prices, Page 85

Pittsburgh—Tin plate shipments and specifications are steady. Heavy demands from canmaking plants on the Pacific coast have offset to a large degree what curtailment is noted in requirement of eastern plants as the result of crop damage.

Railroads

Lehigh & New England Buys 305 Cars, Mexican Railways 115—Reading Divides Rails

TRACK MATERIAL PRICES, PAGE 85

New York—Domestic freight car bookings for August, according to final returns, involved 1070 cars, as compared with 1348 in July. This brings the 8-month total to 35,022 as compared with 66,011 in the corresponding period, 1929, almost half. Further comparisons follow:

	1930	1929	1928	1927
Jan.	5,072	13,196	4,160	14,710
Feb.	17,027	15,944	10,220	5,960
March	6,118	12,023	2,958	4,955
April	1,997	8,205	6,043	3,675
May	1,392	7,562	2,531	5,425
June	998	5,886	2,422	7,440
July	1348	341	582	2,295
Aug.	1,070	2,854	677	1,181
Total 8 mos.	35,022	66,011	28,916	45,641
Sept.	.....	4,517	1,378	682
Oct.	.....	19,506	2,853	886
Nov.	.....	6,361	6,140	1,189
Dec.	.....	9,710	4,799	14,897
Total	.....	106,105	44,763	63,295

Current car demand continues slack and locomotive orders are at a standstill. However, railroads in this district are specifying more freely against their contract requirements for plates, shapes and bars than at any time in more than six months.

Placing of 305 freight cars by Lehigh & New England railroad with Magor Car Corp., takes out of the market one of two sizable lists pending. The other is Illinois Central's of about 2200. These 305 cars will require about 500 tons of shapes, plates and bars. Coach demand is negligible.

Pittsburgh—Inquiry by railroads is limited to a few small requests covering miscellaneous steel products. Activity in track material is light and specifications for fastenings also are quiet. Car buying is confined to export orders, Koppel Industrial Car & Equipment Co. booking 115, 40-ton cars for Mexican Railways Co. Light and relaying rails remain dull.

Chicago—Miscellaneous rail orders, totaling 2000 to 2500 tons, have been placed with Chicago district mills, now operating about 50 per cent. Railroads show interest only in track accessories and steel for repair and maintenance work. Several important track accessory releases have been made in the last several days. Rail inquiries for 1931 may not appear before about Oct. 15. Northern Pacific, however, may buy additional rails soon. Freight car shops operate at a slow rate on repair jobs. Monon, Erie and Nickel Plate railroads will eliminate grade crossings in the Chicago district and build new yards soon. Erie railroad will remove its yards from Hammond, Ind., to Osborn, Ind., where it will join with the Nickel Plate in building yard trackage. The Monon will move its yards from the South Side of Chicago to Stony Island, Ill.

Birmingham, Ala.—Solicitation of of car orders from railroads in the territory supplied by car works of Pullman Car & Mfg. Corp., Bessemer, Ala., has developed no business for immediate attention. Backlogs are being dissipated and labor is on a forced vacation.

Car Orders Placed

Jacob Decker & Sons, Mason City, Iowa, repairs for 50 refrigerator cars, to Ryan Car Co., Chicago.

Lehigh & New England, 305 cars including 300 50-ton steel-sheathed box cars and 5 cabooses, to Magor Car Corp., Passaic, N. J.

Mexican Railways Co., 115 40-ton cars including 85 box, 15 flat and 15 automobile cars, to Koppel Industrial Car & Equipment Co., Koppel, Pa.

New York Central, 50 milk cars, to Merchants Despatch Transportation Co., subsidiary of New York Central.

Wheeling Steel Corp., repairs to five hopper cars, to Koppel Industrial Car & Equipment Co., Koppel, Pa.

Rail Orders Placed

Reading, 24,000 tons of 130-pound rails to Bethlehem Steel Co., Bethlehem, Pa., and 6000 tons to Carnegie Steel Co., Pittsburgh.

Car Orders Pending

Atchison, Topeka & Santa Fe., 10 horse-express cars.

Carnegie Steel Co., 68 70-ton cars including 38 flats and 30 gondolas.

Standard Oil Co. of Indiana, seven gondolas.

Tennessee Copper Co., Copper Hill, Tenn., 50 7000-gallon tank cars; to be placed this week.

Pennsylvania Salt Mfg. Co., Philadelphia, three to five tank cars.

Urges Care in Packing

Washington—Machinery and parts shipped to Hong Kong should be packed with the utmost care, warns the department of commerce. Crates of 2-inch tongued and grooved lumber, reinforced with diagonal braces and iron angles at corners, are generally used for this purpose.

Structural Shapes

Awards Still Active, Totaling More Than 47,000 Tons —Inquiries Also Numerous, with Bridges Leading—Office Buildings, Apartments Top Lettings in the East

STRUCTURAL SHAPE PRICES, PAGE 85

New York—Structural steel awards in the metropolitan district for August totaled 61,689 tons compared with 62,103 tons in July, according to the Structural Steel Board of Trade. Bridges and engineering projects are not included. August, 1929, brought out a tonnage of 74,566, the third largest of the year.

Lettings continue heavy and pending tonnage is large. Awards include a 4000-ton office building and two apartments, 2450 and 2000 tons. Bids go in Sept. 26 on a 5100-ton subway. American Bridge Co. will fabricate 1200 tons for an office building at 101 Wall Street, Post & McCord erecting.

Prices are firmer on plain material and a general effort to strengthen both shape and plate prices may be made within the next few days. Meanwhile fabricated and erected material prices are soft.

Boston—Bids are to be asked this week on the 20-story Professional Arts building here, which in addition to 500 tons of concrete bars will require 2000 tons of shapes. The next large tonnage to come up will be for the 40-story building in Park square section, about 19,000 tons, on which H. K. Ferguson Co., Cleveland, general contractor will take bids shortly.

Pittsburgh—New shape business is slow. Fabricators' backlogs are declining, local awards running almost entirely to small lots. The Kentucky bridge program, taking about 22,000 tons, leads active projects. Bids close Sept. 10, 15 and 18 on various portions of this work. Specifications for plain material are fairly steady. The market is 1.60c to 1.65c, Pittsburgh.

Cleveland—While local awards in structural shapes are scarce, lettings throughout the state keep up fairly well, although at prices disastrously low if all costs are taken into consideration. Some figures on material fabricated and erected would indicate a plain material price of as low as 1.40c, but mills say they are maintaining a minimum of 1.60c, Pittsburgh. One job recently let to a Detroit shop carried a price of $58 a ton fabricated and erected and the erection was figured at no more than $9 a ton. Toledo art museum, 1700 tons, went to Hiner Structural Steel Co., while a 350-ton factory there went to Flint Structural Steel Co. The union station, Columbus, O., 1050 tons, went to McClintic-Marshall Co. Cleveland Clinic hospital, 550 tons, has not yet been let but the general contract on the warehouse for New York Central at East Fortieth street, 560 tons, went to Hecker-Moon Co., which probably will buy the steel this week. A bank at Dayton, O., 4000 tons, and the state office building, Columbus, O., also are to be closed this week.

Philadelphia—Shape demand continues quiet with eastern mills operating 50 to 65 per cent. Prices on plain standard shapes are 1.60c to 1.65c, base, eastern mill, with occasional differentials.

Chicago—Structural steel work consists mainly of small railroad orders for repairs and maintenance work, viaducts and highway bridges. The local outlook is not promising but outside the district more work is in sight. Many Chicago schools built in recent years are being reinforced with structural steel and some tonnage already has been let. About 40 schools will be remodeled. Among fresh projects is 1500 tons for the Grand avenue viaduct, Chicago. Efforts are being made to maintain prices on the basis of 1.75c, Chicago, for plain material. Some plain material contracts are being signed for fourth quarter.

Birmingham, Ala.—While the several structural fabricating shops operating full time, no new contracts above 100 tons have been reported recenty. Steel for Jefferson county almhouse mostly joists was awarded Truscon Steel Co. on its bid of about $10,000.

Awards Compared

	Tons
Awards this week	47,615
Awards last week	46,255
Awards two weeks ago	35,610
Awards this week in 1929	20,717
Av. weekly awards, 1930	36,329
Av. weekly awards, 1929	42,213
Av. weekly awards, Aug.	40,884
Tot. awards to date, 1929	1,551,939
Tot. awards to date, 1930	1,344,178

Contracts Placed

5000 tons, Security Bank building, Kansas City, Mo., to Kansas City Structural Steel Co., Kansas City.

5000 tons, railroad terminal, St. Louis, to American Bridge Co.

4000 tons, 40-story offices and show rooms, Madison avenue and Fifty-third street, New York, to Hedden Iron Construction Co., New York; Dwight P. Robinson Co., general contractor.

2500 tons, Hawkesbury-Grenville bridge, Hawkesbury, Ont., to Canadian Bridge Co., Walkerville, Ont.

2450 tons, 19-story penthouse apartment, Central Park west and Ninety-second street, New York, to McClintic-Marshall Co.; Emery Roth, architect; Henry Kaufman, president of building corporation.

2000 tons, 18-story penthouse apartment, Central Park west and Eighty-eighth street, New York, to Paterson Bridge Co., Paterson, N. J.

1700 tons, art museum, Toledo, O., to Hiner Structural Steel Co., Canton, O.; A. Bentley & Sons, Toledo, general contractors.

1600 tons, north approach to outer drive bridge, Lincoln Park, Chicago, to American Bridge Co., Pittsburgh.

1550 tons, dormitories, Yale university, New Haven, Conn., to Shoemaker Bridge Co., Pottstown, Pa.

1200 tons, extensions to elevated platforms, Chicago Rapid Transit Co., Chicago, to Hansell-Elcock Co., Chicago.

1200 tons, shop addition, A. O. Smith Corp., Milwaukee, to Lakeside Bridge & Steel Co., Milwaukee.

1200 tons, building, Bell Telephone Co., Philadelphia, to Shoemaker Bridge Co., Pottstown, Pa.

1075 tons, post office, Wichita, Kans., to Mississippi Valley Structural Steel Co., Decatur, Ill.; Murch Bros. Construction Co., general contractor.

1050 tons, union station, Columbus, O.; let through Anderson, Graham, Probst & White, Chicago, architects, to McClintic-Marshall Co., Pittsburgh.

1030 tons, loft, Thirtieth street and Seventh avenue, New York, to Dreier Iron Works, New York.

1000 tons, Murphy Quigley garage, Philadelphia, to Bethlehem Fabricators Inc., Bethlehem, Pa.

1000 tons, bridge over Fresh Kills, Staten Island, N. Y., to Fort Pitt Bridge Works, Pittsburgh.

900 tons, state highway bridge, Lehigh Gap, Pa., to Bethlehem Steel Co., Bethlehem, Pa.; Parker & Graham Inc., New York, general contractor.

900 tons, 8-story bank and office building, Peoples Bank & Trust Co., Passaic, N. J., to Hinkle Iron Co., New York; John W. Ferguson Co., general contractor.

850 tons, bridge and viaduct, Dallas-Oak Cliff, Tex., to Austin Bridge Co., Austin, Tex.

750 tons, apartment, 40 West Eighty-sixth street, New York, to Harris Structural Steel Co., New York; Samuel Barkin & Sons, builders.

700 tons, shaft sets for Pickands, Mather & Co., Minnesota mine, to Worden-Allen Co., Milwaukee.

640 tons, Sterling Hall of Medicine, Yale university, New Haven, Conn., to Palmer Steel Co., Springfield, Mass., and not Shoemaker Bridge Co., as reported last week.

640 tons, apartment-church, 307 East Fiftieth street, New York, to Dreier

Iron Works, New York.

575 tons, auditorium, Claremont, Calif., to Pacific Iron & Steel Co., Los Angeles.

500 tons, Limoilou bridge at Quebec, Que., to Eastern Canada Steel & Iron Works Ltd., Quebec.

400 tons, plant, Stockton Firebrick Co., Pittsburg, Calif., to Dyer Bros., San Francisco.

400 tons, plate mill and other developments, Tennessee Coal, Iron & Railroad Co., Fairfield, Ala., to Virginia Bridge & Iron Co., Birmingham, Ala.

400 tons, bridges, Boston-Worcester turnpike, to Bethlehem Steel Co.

400 tons, highway bridge for Illinois highway commission to Clinton Bridge Works, Clinton, Iowa.

350 tons, smelter stack, Calumet & Arizona Mining Co., Douglas, Ariz., to Kansas City Structural Steel Co., Kansas City, Mo.

350 tons, factory building, Toledo, O., to Flint Structural Steel Co., Flint, Mich.

300 tons, apartment, San Francisco, to Golden Gate Iron Works, San Francisco.

300 tons, service station, New York & Queens Electric Light Co., Flushing, N. Y., to Shoemaker Bridge Co., Pottstown, Pa.

300 tons, additional for Fine Arts building, Jackson Park, Chicago, to McClintic-Marshall Co., Pittsburgh.

300 tons, hospital addition, Asbury Park, N. J., to Breen Iron Works; Walter Kidee Co., general contractor.

260 tons, garage, Autocar Co., Philadelphia, to Robinson Iron & Steel Co., Philadelphia.

260 tons, Mercy hospital, Albany, N. Y., to Leach Steel Corp., Buffalo.

250 tons, warehouse, Humble Oil & Refining Co., Baytown, Tex., to Orange Car & Steel Co., Orange, Tex.

250 tons, reformatory, Rahway, N. J., to Breen Iron Works, Newark, N. J.; Charles R. Hedden Co., general contractor.

250 tons, dryer house extension, Milwaukee sewage disposal plant, to Worden-Allen Co., Milwaukee.

225 tons, bridges, Charles river, Boston-Somerville, Phoenix Bridge Co., Phoenixville, Pa.

200 tons, state highway bridge, Plymouth, N. H., to Kittredge Bridge Co., Concord, N. H.

200 tons, shapes and plates, for Panama Canal Zone to Bethlehem Steel Export Corp., Bethlehem, Pa.

200 tons, two apartments, Barnes avenue, Bronx, N. Y., to Eschen & Oboler Iron Works Inc., Bronx; Barnesboro Construction Co., builder.

180 tons, nurses' home, Binghamton city hospital, Binghamton, N. Y., to Bethlehem Steel Co.

165 tons, St. Francis church, Ridgefield Park, N. J., to Albert Smith's Son Inc., Jersey City; H. Montague & Son Inc., general contractor.

150 tons, plant addition, John F. Norman Co. Inc., Linden, N. J., costing $300,000, to the Austin Co., Cleveland.

125 tons, bridge at Colebrook, B. C., for Great Northern railway, to Western Bridge Co. Ltd., Vancouver, B. C.

115 tons, creamery at Caldwell, Idaho, to Austin Co., Seattle.

110 tons, telephone building, Summitt, N. J., to Ferguson-Phin Iron Works, Jersey City; Deakman-Wells Co., general contractor.

105 tons, 1-story addition, Boye & Emmes Machine Tool Co., Cincinnati, to the Austin Co., Cleveland.

100 tons, bridge at Plymouth,, N. H., to Burlington Construction Co.

100 tons or more, 3-story warehouse, Virginia Electric Light & Power Richmond, Va., to Virginia Bridge & Iron Co., Roanoke, Va.; John T. Wilson Co. Inc., general contractor.

100 tons, bridge at Orange, Mass., for Boston & Maine railroad, to Shoemaker Bridge Co., Pottstown, Pa.

100 tons, plant, United States Steel Grave Vault Co., Galion, O., to the Austin Co., Cleveland.

100 tons, Presbyterian church and parish house, Plainfield, N. J., to Charles Dollar Co., New York; Wigton-Abbott Corp., general contractor; 50 tons of reinforcing bars to J. T. McCoy Co., New York.

100 tons, county bridge at Acme, Whatcom county, Washington, to Pacific Car & Foundry Co., Seattle.

100 tons, school at Chillicothe, O., to Hiner Structural Steel Co., Canton, O.

Contracts Pending

7000 tons of shapes and 2000 tons of sheet piling, Market street subway extension, Philadelphia; Dravo Construction Co., Pittsburgh, low bidder.

5100 tons, subway, route 107, section 8, Lafayette street, Brooklyn, N. Y.; bids Sept. 26, tonnage noted Aug. 28 issue STEEL.

2000 tons, Professional Arts building, Boston; bids to be asked this week.

1800 tons, state building, Los Angeles; new bids Sept. 30.

1500 tons, Grand avenue viaduct, Chicago.

850 tons, Coplay-Northampton bridge, Pennsylvania; Whitaker & Diehl, Harrisburg, Pa., low bidders on general contract.

560 tons, warehouse or freight handling station, East Fortieth street, Cleveland, for New York Central railroad; general contract to Hecker-Moon Co.

550 tons, Cleveland Clinic hospital, Cleveland; general contract to Crowell & Little Construction Co., Cleveland.

500 tons, department store, Fargo, N. D.

450 tons, junior high school, Washington, Pa.; E. B. Lee, Pittsburgh, architect; bids due about Sept. 15.

300 tons, office building, Westchester Lighting Co., White Plains, N. Y.

275 tons, freshman dormitory, Harvard university, Cambridge, Mass.

205 tons, bridge on Adhfork-Kingman highway, Phoenix, Ariz.; bids Sept. 22.

200 tons, addition, Institute for Crippled and Disabled Children, First avenue, New York.

200 tons, state highway bridges, New York.

100 tons, hospital, Everett, Mass.

Concrete Bars

Bridges, Highways, Subways Create Much Business —Kentucky Bridges to Take 2700 Tons — Philadelphia Subway, 2000 Tons—Award Total Subsides Somewhat

REINFORCING BAR PRICES, PAGE 85

New York—Several mills are taking a firmer attitude on concrete reinforcing bar prices. While still weak on large tonnages, distributors are more unwilling to make long commitments at present low levels. It is believed that prices have touched bottom. Bars are quoted nominally 1.65c to 1.70c, Pittsburgh, but large lots have moved under the inside figure. Bridges, highway construction and subways call for several thousand tons. General contracts have been placed in New Jersey calling for close to 3000 tons. More bids will be taken Sept. 1!

Boston—Odd tonnages placed in concrete bars last week aggregated around 200 tons. The largest new inquiry calls for 500 tons for the Professional Arts building here. The 650 tons for a biological laboratory at Cambridge, Mass., still is pending.

Pittsburgh—Reinforcing bar business spurted recently. With a fair tonnage on inquiry and in prospect the immediate outlook is increasingly favorable. Mill bookings were heavier the past week so that the usual seasonal downturn is absent. Bids close this week on part of Kentucky's bridge-building program involving about 2700 tons of bars

Cleveland—Several small jobs have been let requiring concrete bars. The largest is an office building at East Ninth street and Chester avenue, 110 tons, to Truscon Steel Co. Included among numerous small projects awarded Republic Structural Iron Works are 100 tons for Brecksville road culvert and 50 tons for road work in Brooklyn village. A

(*Concluded on Page* 93)

Awards Compared

	Tons
Awards this week	**4,797**
Awards last week	**6,663**
Awards two weeks ago	**11,055**
Awards this week in 1929	**6,485**
Av. weekly awards, 1929	**5,849**
Av. weekly awards, 1930	**6,829**
Average weekly awards Aug.	**6,461**
Total awards to date, 1929	**232,915**
Total awards to date, 1930	**252,708**

Strip

Tonnage in Moderate Upturn—Last Quarter Books Not Open—Sellers Stand Firm on Price

STRIP PRICES, PAGE 85

Pittsburgh — Strip business improved moderately during the past week, orders being more numerous and better distributed among consumers even though individual tonnages remained light. Demand from automotive interests remains dull despite some pickup recently. Strip makers profess to be taking a firm stand on prices and are naming 1.65c and 1.75c as minimums for the two sizes of hot strip on future business. These quotations had been subject to occasional shading. Fourth-quarter books have not been opened officially. On cold-rolled strip, 2.35c is named as a minimum with small tonnages still commanding 2.45c. Mill operations have been increased with hot strip at 40 to 50 per cent and cold at 35.

New York—Hot strip prices are stronger. Not only are some sellers adhering more rigidly to the 1.65c and 1.75c, Pittsburgh, prices, but in at least one case a seller has announced 1.80c, Pittsburgh, on the wide. Cold rolled strip, however, manifests little firmness, with 2.35c, Pittsburgh, the representative figure, despite efforts of some to obtain 2.45c.

Cleveland—Slight expansion in strip steel tonnage is noted, particularly hot. Cold-rolled is quiet, with orders scattered and for small amounts. An effort is being made to stiffen the cold price, even though tonnage is meager. Some quote 2.45c, Cleveland; others have again taken even small orders at 2.35c. Hot remains quotably unchanged 1.65c, Pittsburgh, for wide and 1.75c for narrow, although some was recently bought at $1 a ton less. The upturn in tonnage is attributed to better operations among automotive consumers.

Chicago — Hot strip makers generally are quoting 1.85c, Chicago, for 6-inch strip and narrower, and 1.75c for wider than 6-inch, a drop of $1 a ton. Hot-strip operations remain at about 50 per cent, with no perceptible gain in tonnage. No automotive tonnage is in sight for the cold strip makers. A little Ford and Chevrolet business is being released here.

Youngstown, O.—Hot-rolled strip appears holding its own here with difficulty as new demand has not followed upon Labor Day's shutdowns as expected. A fair volume of new releases is reported by local mills, while cold-rolled is not so encouraging. The absentation of automotive interests from the market is marked. Hot-rolled is 1.75c, Pittsburgh, and cold-rolled 2.35c to 2.45c.

Warehouse Sales Gaining Little in September

Warehouse Prices, Page 107

Boston—The plentitude of small jobs throughout New England has maintained a good demand from warehouses. But the lack of any sizable developments, a few of which would be appreciated, leaves the general trade situation in a dull range. Prices for small shipments hold well.

New York—Jobbers report a gain over a week ago, although describing the market as still far from brisk. Prices are unchanged.

Philadelphia—Warehouse interests report a slight improvement in sales but this is only comparative. Cold strip from stock is now quotable at 4.75c base.

Pittsburgh—Sales show a slight improvement over a month ago. Cold-finished bars are more active and plate demand is improved in some quarters. Sheets still are slow. Prices generally are unchanged.

Cleveland—Reports indicate that August business followed approximately the same trend and aggregated about the same volume as July. Orders continue relatively small in point of tonnage, but are being received with fair regularity. Prices hold at unchanged levels.

Cincinnati — Warehouse business here since Labor Day has shown little change from the August rate. Tonnage remains light. Prices are unchanged.

St. Louis—Final reports of iron and steel warehouses indicate a slightly larger volume of business transacted in August than July, which earlier month in turn showed a moderate gain over June. The improvement, according to one leading interest, is accounted for by miscellaneous buying. The usually large consumers have not augmented their takings to any extent. Prices remain unchanged on all standard commodities.

Chicago — Warehouses have reduced prices $5 a ton on black and galvanized sheets. This is ascribed to the recent weakened mill prices, and not to any noticeable reduction in tonnage turnover. No. 24 galvanized have been cut to 4.35c. No. 24 black sheets now are quoted 3.80c, the $5 reduction affecting also gages No. 18 and lighter. No announcements have been made here on St. Paul and St. Louis prices. Warehouse business is making no gains, though buying is fairly well diversified.

Operations Show Moderate Open-Hearth Gains

Cleveland—With 14 of the district's 34 open hearths on this week, operations at 41 per cent are the best in four weeks. Finishing mills are at approximately the same level as last week. Otis Steel Co. has stepped up to four open hearths pouring and Corrigan, McKinney Steel Co. is up to five.

Youngstown, O.—Independent and Corporation steel production is largely unchanged with the independents charging 28 of their 51 open-hearths and Corporation ingot output at about 55 per cent.

Improvement in the operation of flat rolling departments is becoming more noticeable in this week's plant schedules. Better demand for automotive sheets is seen in an advance of 20 per cent in operations of Newton Falls plant of Newton Steel Co.

Birmingham, Ala.—Steel furnaces and finishing mills in southern territory are operating at 55 to 58 per cent. Sheet mills are going at a little more than 50 per cent, while plate mills will do somewhat better. Inquiries are declared better, with gradual improvement anticipated this month.

Pittsburgh—Steelworks operations hold at 55 per cent. Several independents continue at a lower rate but the leading interest is reported running nearly full at one plant. Sheet mills hold at a 50 per cent rate with tin plate 70, or slightly better. Strip schedules are higher at 40 to 50 with pipe lower at 60 to 65.

Buffalo — Operation of Buffalo steelworks has declined to 48 per cent of open-hearth capacity, equalling the low point of the year for a sustained period. Executives see no prospect of an early major increase in production.

Chicago—Ingot output has gained slightly to 57 per cent. As measured by steelworks blast furnace activity, no change has occurred. The leading interest has 11 of its 27 blast furnaces blowing. Of the district's 36 steelworks blast furnaces, 16 are in blast. Finishing mill operations are commensurate with the ingot rate.

Concrete Bars

(*Concluded from Page* 89)

100-ton, Oberlin, O., dormitory is up.

Chicago—Following active reinforcing bar business in this market for about 30 days, due in part to heavy road and bridge contracts, demand shows signs of slackening. Rail steel bars for road, bridge and culvert work are quoted 1.65c to 1.75c.

Buffalo—Formal inquiry is out for 700 tons of reinforcing bars for the Erie-Nickel Plate terminal here. Several good sized tonnages of welded mesh are due to be purchased following state road awards last week.

Birmingham, Ala.—Orders for reinforcing concrete bars are less active. Deliveries are being rushed.

Contracts Placed

500 tons, Illinois road work, to several unstated fabricators.

500 tons, Monroe street sewer, Chicago, to Concrete Steel Co., Chicago.

400 tons, Veterans' hospital, Somerset Hills, N. J., to Truscon Steel Co., Youngstown, O.;; General Contracting Co., Trenton, N. J., general contractor.

350 tons, tunnel construction, Yonkers, N. Y., board of water supply, New York, to Concrete Steel Co., New York; Patrick McGovern Inc., general contractor.

350 tons, Union avenue viaduct, board of public service, St. Louis, to Missouri Rolling Mills Corp., St. Louis.

307 tons, store, Halle Bros., San Jose, Calif., to Pacific Coast Steel Corp., San Francisco.

300 tons, Bronx Parkway extension, Westchester county extension, Westchester county, N. Y., to Concrete Steel Co., New York; Immeck Construction Co., general contractor.

250 tons, telephone building, Elmira, N. Y., to Kalman Steel Co., Chicago; miscellaneous iron work, to Phelan Iron Works, Syracuse, N. Y., J. G. White Engineering Corp., New York, general contractor.

200 tons, state highway construction, New York, to Concrete Steel Co., New York.

200 tons, subway, route 103, section 3, Manhattan, and Church-Franklin street connection between Eighth avenue and Worth street routes, Manhattan, N. Y., to Igoe Bros., Newark, N. J. Hart & Early Co. Inc., general contractor.

200 tons, auditorium, Claremont, Calif., to unstated interest.

180 tons, sewer, Mt. Vernon, N. Y., Westchester County Sanitary commission, to Tidewater Structural Material Corp., Hagerstown, Md.; Marinelli Construction Corp., general contractor.

160 tons, garage, Missouri highway commission, Jefferson City, Mo., to Laclede Steel Co., St. Louis.

150 tons, 3-story warehouse, Virginia Electric Light & Power Co., Richmond, Va., to Virginia Steel Co., Richmond; John T. Wilson Co. Inc., Mutual building, Richmond, general contractor.

150 tons, superstructure, north approach to Grand avenue bridge, Lincoln Park, Chicago, to American System of Reinforcing, Chicago.

150 tons, Brecksville road culvert near Cleveland, 100 tons, and road work in Brooklyn village, to Republic Structural Iron Works, Cleveland.

140 tons, warehouse, Eyres Transfer & Storage Co., Seattle, to Pacific Coast Steel Co., Seattle; A. F. Mowat, Seattle, general contractor.

110 tons, office building, Acme Realty Co., East Ninth street and Chester avenue, Cleveland, to Truscon Steel Co., Youngstown, O.

100 tons, work including reformatory, 65 tons, Rahway, N. J., to Kalman Steel Co., Chicago; Charles R. Hedden Co., general contractor.

100 tons, state bridge, Monitor, Chelan county, Wash., to Northwest Steel Rolling Mills, Seattle.

Contracts Pending

2700 tons, 11 state bridges, Kentucky; bids close this week.

2000 tons, Market street subway extension, Philadelphia; Dravo Construction Co., Pittsburgh, low bidder.

700 tons, Erie-Nickel Plate terminal, Buffalo; John W. Cowper Co., Buffalo, general contractor.

500 tons, Professional Arts building, Boston; bids to be asked this week.

400 tons, dormitories, University of Chicago.

315 tons, Maline creek sewer, board of public service, St. Louis.

250 tons, highway, Staten Island, N. Y.

200 tons, office building, Vermont street, Los Angeles; bids being received.

200 tons, Grand avenue viaduct, Chicago.

150 tons, shops, Hadley vocational school, board of education, St. Louis.

134 tons, two bridges in Alameda county, Calif.; bids Sept. 25.

100 tons, dormitory, Oberlin college, Oberlin, O.

Unstated tonnage, outer drive bridge approaches, Lincoln park, Chicago.

Pipe

Industrial, Utility Buying Is Fair—Baltimore Awards 4500 Tons—7500-ton Steel Line Up

PIPE PRICES, PAGE 107

New York—Outside of a 4500-ton cast pipe award for Baltimore and 1100 tons pending in Fishkill, N. Y., little activity is encountered. Small lot business is fair. New York subway construction is taking a sizable tonnage, pipe being supplied by an Emaus, Pa., foundry. Foundry backlogs are further reduced and some production schedules have been curtailed. Prices hold fairly firm at $36 to $37, eastern and southern foundry. Bids are in on 300 tons of 6-inch for Colonie, N. Y. Kennedy Valve Co., Elmira, N. Y., was awarded gate valves for the department of public works, Boston, on a bid of $19,822.

Boston—Private business in cast pipe remains fair. A few municipal lettings come out regularly. Prices usually are firm, although on competitive business bidding runs low on worth while tonnages. Stoughton, Mass., awarded 345 tons to R. D. Wood & Co., while two other awards totaled 230 tons. Carload orders are in fair volume.

Pittsburgh—A slight seasonal gain is noted in standard pipe. Most other tubular products remain quiet, oil country goods being decidedly dull in some sections. Merchant pipe business has lagged during the year to date and no substantial pickup is expected during remaining months. New line pipe orders are lacking but new work still is being discussed. Southern Natural Gas Corp. will require about 7500 tons for a 67-mile addition to its network in the Southeast. Backlogs of the larger sizes of lapweld and seamless pipe are substantial despite recent quietness. Mechanical tubing continues dull. Locomotive and boiler tubes are only fair.

Cleveland—Buttweld tonnage is slowing up. Most mills still have good backlogs of lapweld. Jobbers are not enjoying a rapid turnover in pipe for building purposes. Orders for several carloads for two buildings are pending here.

Chicago—Private orders, largely from industrial and utility companies, contribute to a fair cast pressure pipe business. Several producers report sales the first eight months ahead of the similar period last year. Contractors are pushing for shipments before cold weather. Municipal work remains light. Chicago delivered prices for 6 to 24-inch are unchanged at $45.20 to $46.20. Minneapolis awarded 860 tons of 8 to 24-inch. Detroit is inquiring for about 200 tons of odd sizes of pipe and also fittings for a filter plant.

Birmingham, Ala.—Authoritative statements are made by pipe sellers that the market shows improvement. Actual business reported, however, is not so encouraging. Production has been curtailed a little but shipments still are good so that yard stocks have been reduced materially. A few lettings are reported weekly but the aggregate is not heavy.

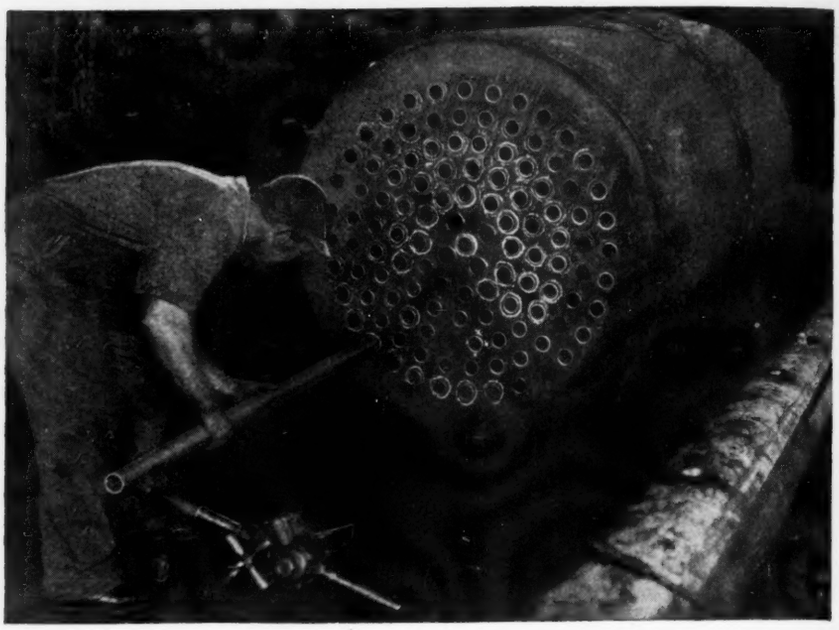
Contracts Placed

4500 tons, cast pipe, various sizes with fittings, for Baltimore, to United

These Boilers

—are constantly shifted about

—use all sorts of water



Yet the tubes stay in the boiler

TUBE service in boilers which are constantly being shifted around the country, using whatever water is available, is unusually severe. Bad water readily attacks the tubes. Constant shifting loosens the tubes in the sheets. Costly tube renewals are frequent.

To solve this costly tube problem, companies operating portable boilers are adopting seamless TONCAN IRON tubes, because only TONCAN tubes possess the corrosion resistance, ductility, high strength and ready workability essential for this service.

And for all boilers, Seamless TONCAN IRON tubes possess all qualifications for long, economical service. Learn more about them. Send for the TONCAN Tube booklet.

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IRON

THE
BABCOCK & WILCOX TUBE COMPANY

85 LIBERTY STREET NEW YORK, N.Y.

States Pipe & Foundry Co., East Burlington, N. J.

860 tons, 8 to 24-inch cast pipe for Minneapolis, to American Cast Iron Pipe Co., Birmingham, Ala.

345 tons, 6 and 8-inch cast pipe for Stoughton, Mass., to R. D. Wood & Co., Florence, N. J.

338 tons, 2-in. centrifugal cast pipe for Los Angeles, to Pacific States Cast Iron Pipe Co.

190 tons, 16-inch class B for Thirty-fifth avenue, N. E., Seattle, to French producers.

130 tons, 6 and 8-inch cast pipe for Newton, Mass., to Donaldson Iron Co., Emaus, Pa.

100 tons, 12-inch cast pipe, department of water supply, gas and electricity, Bronx, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

100 tons, 6-inch cast pipe for Ipswich, Mass., to Donaldson Iron Co., Emaus, Pa.

Contracts Pending

2022 tons, 4 to 8-inch class B to 250, cast pipe for East Bay municipal Utility District, Oakland, Calif.; bids Sept. 2.

1577 tons, 8 and 12-inch class 150 cast pipe for Los Angeles; bids Sept. 11.

1100 tons, 10 and 6-inch cast pipe for Fishkill, Dutchess county, N. Y.; J. P. Wells, Rochester, engineer; bids Sept. 15.

260 tons, cast pipe for state work, Raybrook, N. Y.; bids in; Murihead Engineering Corp., Albany, low on general contract.

225 tons, 10 and 6-inch cast pipe for Morgan City, La., bids Sept. 16.

200 tons, odd sizes of cast pipe and also fittings for Detroit filter plant; bids in.

189 tons, 2 to 8-inch class C cast pipe, improvement of Fifty-fourth street, San Diego, Calif.; bids received.

Unstated tonnage, 6-inch cast pipe for District of Columbia, Glamorgan Pipe Co., Lynchburg, Va., low.

Unstated tonnage, 4460 lineal feet of 12-inch and 500 feet of 6-inch class C cast pipe, with seven fire hydrants, etc., for campus main, University of Wisconsin, Madison, Wis. J. D. Phillips, business manager, taking bids until Sept. 26.

Steel Pipe Inquiries

7500 tons, 67 miles 12¾-inch line pipe for Southern Natural Gas Corp. line extension in Alabama and Florida.

Oil Well Supply Is Sold

Pittsburgh—Stockholders of the Oil Well Supply Co. Sept. 9 approved sale of the assets of the company to the United States Steel Corp. exclusive of treasury stock and the franchise. Transfer of assets is to be completed by Sept. 30.

Extends Pig Iron Rate

New York—Interstate commerce commission has formally announced extension of rail-water rates on southern pig iron into the north to Sept. 30, 1931.

Wire

Jobbers Not Adding to Stocks—Demand Gain Generally Absent as Prices Still Are Shaded

WIRE PRICES, PAGE 85

Chicago — Slight gains are apparent in merchant wire specifications from jobbers serving rural sections. Barbed wire and staples are fairly active. Gains in merchant demand nevertheless are below the usual percentage of recovery from seasonal lull. Manufacturers' wire continues extremely dull. Western wire mill operations are 40 to 50 per cent. Prices remain at 2.35c, Chicago or western mills, for plain wire, and $2.10 to jobbers for wire nails, despite further pressure from buyers.

Worcester, Mass. — Specifications opening for third quarter delivery give promise of some advance in wire production. Deliveries are showing tendency toward greater volume and this coupled with an enlivened flow of inquiry for the regular lines, along with some activity in specialties, gives the market a better tone. Plain bright wire to dealers is 2.40c, base, Worcester.

New York—Nails have steadied at $2, Pittsburgh, with bright wire at 2.30c, Pittsburgh, and black annealed 2.20c. Demand remains sluggish.

Pittsburgh—Improvement is lacking in demand for practically all grades of wire products. Distributors of materials used in the agricultural districts have had no occasion to add to their stocks and activity in both nails and manufacturer's wire is lagging. Some scattered inquiry for fourth quarter is appearing but producers as yet have named no prices for that period. Current quotations are expected to be continued. Plain wire remains fairly steady at 2.30c. Nails gradually have settled to $2 to jobbers in a number of districts. Wire rods are $36.

Cleveland—Some wire nail jobbers claim ability to buy nails at as low as $1.95, Cleveland. Several producers, however, maintain a $2.05 price, with 2.30c, Cleveland, applying on manufacturers' wire. Jobbers' wire is less, about 2.20c. Orders are scattered and in small quantities.

Bolt, Nut, Rivet Prices Carry Into Last Quarter

Bolts, Nuts, Rivets Prices, Page 96

Chicago—Fourth-quarter contracts are being signed by buyers of bolts, nuts and rivets without delay and with little discussion of prices, but this is not considered highly significant in view of this year's extremely light specifications against contracts. Implement and tractor orders continue disappointing. Jobbers and small industries are better represented in current shipping orders than the implement and automotive groups. Production of bolts, nuts and rivets continues at 40 to 45 per cent. Small rivets are unchanged at 70, to 70, 10 and 5 off.

New York—Shipyard buying continues the only feature of an otherwise featureless market. Jobbers are specifying slowly and little gain is noted in other directions. No price change for fourth-quarter contracts is expected.

Philadelphia—Large tonnage of rivets will be required for the Market street subway extension on which Dravo Construction Co., Pittsburgh, is low bidder. There is also a considerable tonnage to be required in some piers to be built here.

Pittsburgh—Fourth quarter contracts for bolts, nuts and rivets are being issued to the trade. Prices are unchanged from present levels of 73 off for bolts and nuts; 2.75c, Pittsburgh, for large rivets; and 70, 10 and 5 off for small rivets. Specifications against existing contracts are light and lack improvement over the quietness of recent weeks. Purchases continue restricted in both tonnage and number. Operations remain at 40 to 50 per cent.

Cleveland—Nut, bolt and rivet manufacture is enjoying a slight upturn. Operations still average around 50 per cent but orders are a trifle more numerous, particularly from automotive users. Manufacturers believe the corner now turned and that from now on orders will increase. Little or no interest, however, is manifested in fourth quarter.

Birmingham, Ala.—New plant of Lamson & Sessions Co. is now in full operation and shipping steadily. Plant is using 1000 tons steel a month and for first time is furnishing bolts and rivets to stove manufacturers. Increased production will be possible by double turn operation and later by additions, site being sufficient.

American Gear Co. of Michigan, Jackson, Mich., has redeemed its $25,000 of preferred stock capital with like amount of common stock.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$17.50
Pittsburgh, district fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Valley, furnace	18.00
Cleveland fur., local del.	17.50
Philadelphia, delivered	19.26 to 19.76
Virginia, furnace	17.75
Granite City, Ill., fur.	18.00 to 18.50
Buffalo, fur., local del.	18.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail Brooklyn	20.91
Buff., all-rail, Newark	19.28
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	17.51 to 18.01
Alabama, del. St. Louis	17.42
Alabama, del. Cincinnati	15.69 to 17.19
Alabama, del. Cleveland	18.51 to 19.01
Ala., Phila., dock del.	16.75 to 17.25
Ala., Balt., dock del.	16.50 to 17.00
Alabama, New York dock	17.00 to 17.50
Ala., Boston dock del.	20.21
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cin.	15.69 to 17.19
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur local del.	19.00
Buff., all-rail, Brooklyn	21.41
Buffalo, all-rail Newark	19.78
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	19.76 to 20.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	20.00
Eastern, del. Phila.	20.26 to 20.76

MALLEABLE

Chicago, furnace	17.50
Cleveland fur., local del.	17.50
Pittsburgh district fur.	19.00
Pittsburgh, delivered	19.63 to 20.13
Valley furnace	18.50
Buffalo fur., local del.	19.00
Eastern Penna., delivered	19.26 to 20.91
Granite City, Ill., fur.	18.00 to 18.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Eastern Penn., del.	18.00 to 18.50
Buffalo fur., local del.	18.00
Montreal, delivered	22.50
Valley furnace	18.00

BESSEMER

Valley furnace	18.50
Pittsburgh, delivered	20.26

LOW PHOS

Valley fur., standard	27.00
Philadelphia, standard	24.26 to 24.76
Furnace, copper-bearing	23.00 to 23.50

GRAY FORGE

Pittsburgh district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13

CHARCOAL

Lake Superior, del. Chicago	27.04

SILVERY

Jackson County, O., fur., in per cents

6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents

10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$33; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ov., Connell. basis	5.50
Portsmouth, O. ov., Connell. basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross Ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58.65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	10.50 to 11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50 to 10.50
Swedish low phos.	11.00
Spanish, North African basic, 50 to 60%	9.50 to 10.00
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$12.25
Chrome ore, 48%, net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	27 to 28 cents
Indian, 48-50%	27 to 28 cents
Brazilian, 46-48%	25 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Per net ton

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore base	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	36.30
Chicago	32.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00
Forgings, Philadelphia	41.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.65c to 1.70c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$99.00
*Ferromanganese, del. Pittsburgh	103.79
Spiegeleisen, 19-21%, domestic fur. spot†	33.00
*Ferrosilicon, 50 per cent, freight all., c. l.	83.50
*Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do., one ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton, carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, import duty paid east, tide, gross ton	19.50

for "above-the-average" Boiler Service!

FOR above-the-average service, install tubes that will endure more-than-the-average hardships. Proved by actual service records—specified by leading railroads and boiler manufacturers—NATIONAL-SHELBY Boiler Tubes offer maximum service and satisfaction in any type of boiler service; they resist pitting and fatigue—hold tight in the tube or flue sheet—cut down renewal expense and "time out" for replacements. Made by the most scientific methods of tube manufacture, under expert supervision and an intensive system of inspection and testing—with consequent long life and efficient service. The wide use of these tubes by discriminating purchasers has definitely established them as—

America's Standard Boiler Tubes

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NATIONAL TUBE COMPANY

Frick Building, Pittsburgh, Pa.

QUALITY PRODUCTS — *Dependable Service*

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

PRINCIPAL SUBSIDIARY MANUFACTURING COMPANIES

AMERICAN BRIDGE COMPANY
AMERICAN SHEET AND TIN PLATE COMPANY
AMERICAN STEEL AND WIRE COMPANY
CARNEGIE STEEL COMPANY
COLUMBIA STEEL COMPANY
CYCLONE FENCE COMPANY
FEDERAL SHIPBUILDING AND DRY DOCK COMPANY
ILLINOIS STEEL COMPANY
NATIONAL TUBE COMPANY
THE LORAIN STEEL COMPANY
TENNESSEE COAL, IRON & R. R. COMPANY
UNIVERSAL ATLAS CEMENT COMPANY

Pacific Coast Distributors—Columbia Steel Company, Russ Building, San Francisco, Calif. *Export Distributors*—United States Steel Products Company, 30 Church Street, New York, N. Y.

Pig Iron

Sales Larger in Northern Market—Cleveland Price Down—Lower Offers Appear at Chicago

PIG IRON PRICES, PAGE 96

Chicago—Inquiry for pig iron is more general and sales are picking up slightly. The Zenith merchant stack at Duluth may be banked for repairs soon, but production is continuing about 60 per cent of capacity. Several makers of special machinery are closing for tonnages but buying for implements and tractors is light. A manufacturer in the Chicago district purchased 2000 tons for Wisconsin and Michigan plants. About 300 tons of silvery iron is on inquiry. Silvery prices are lower, as shown by the new schedule issued by a Jackson county, O., producer. Lower offers again are competing with the $17.50 base furnace price for northern grades of foundry iron, through steelworks. Sellers say $17 is the low point on eastern iron now at Chicago district docks.

Pittsburgh—Orders for pig iron lack improvement, melters entering the market only for small lots as needed, and the turnover is light. Consumers' stocks are small. No interest is shown by buyers in long term contracts at present prices, with inquiry dull. Prices are nominal at $18, valley, for No. 2 foundry and basic, and $18.50 for bessemer and malleable. Some reports of shading are heard but business is insufficient to give an accurate price trend. Producers are willing to quote lower on attractive lots but none appears.

Boston—Sales of pig iron in New England dropped to 1200 tons for the week. Prices are steady, Buffalo furnaces quoting $16 for No. 2 plain and No. 2X, and $16.50 for No. 1X. Eastern furnaces continue to meet these prices.

New York—Pig iron sales in this district show a slight gain, aggregating more than 7000 tons for the week. Two leading sellers report that approximately 70 per cent of their recent orders have been for immediate delivery. New inquiry is light. Prices are unchanged at $16, base, for Buffalo foundry iron, with waiving of differentials still noted in some instances. Southern foundry iron is unchanged at $17 to $17.50, delivered, New York docks.

Buffalo—The Bethlehem Steel Co. has banked one stack at Lackawanna, leaving only two in operation there. The Tonawanda Iron Co.'s stack is to be banked within a few days. There will thus be only six furnaces making iron here, with 12 idle, the lowest rate in years. Inquiry is small and sales light. Prices are unchanged.

Worthington Pump & Machinery Corp. is reliably reported to have placed 500 tons for its Buffalo plant.

Philadelphia—A Virginia furnace sold 8000 tons of pipe iron in the past week. The Virginia foundry iron market is unchanged at $17.75, base, furnace. Demand generally is quiet. Eastern Pennsylvania foundry iron is held at $18.50 to $19, base, furnace, with occasional shading.

Cleveland—Cleveland blast furnaces have adjusted their prices for local delivery more in line with those which have applied recently on shipments to outside competitive points. A reduction of 50 cents brings the base price to $17.50, the lowest since early in 1928. A few sales have been made on the new basis, but it has not stimulated business. No change has been announced in lake furnace prices of $16.75 to $17, base, for northern and western Ohio and northern Indiana. It has been necessary for some sellers to waive siliquarter and in some directions sales picked up during the past week.

Cincinnati—Inclusion of 1900 tons of northern iron for a southern Ohio melter raised the total of pig iron sales in this district since Labor day to more than 4500 tons. A central Ohio firm bought 500 tons and a southern Ohio melter 200 tons at prices reported about $16 to $17, base, lake furnace.

St. Louis—Shipments of pig iron continue at the daily average rate of August. New sales are in small volume, and inquiries for fourth quarter are lacking. Prices are irregular, governed to a large extent by circumstances. Bookings in this district in the past week totaled approximately 1800 tons.

Youngstown, O.—Pig iron sales continue small. Shipments are fair, but stocks on furnace yards are increasing. No. 2 foundry holds at $18, valley, and malleable and bessemer at $18.50.

Toronto, Ont.—Demand for merchant pig iron is picking up slowly. Inquiries are coming out but the majority are for small spot tonnages a resumption of contract placing is expected about the middle of this month. Prices are unchanged.

Birmingham, Ala.—Production of pig iron is being curtailed to prevent increase in stocks. No sales are reported for fourth quarter. The base price for delivery in this district continues $14, while lower prices are quoted for shipment to distant competitive points.

Ferromanganese Shipments More Active; Sales Quiet

Ferroalloy Prices, Page 96

New York—Specifications for manganese are coming out more freely, with prices unchanged at $99, duty paid, tidewater, on lots of carloads to 500 tons annually. Domestic spiegeleisen, 19 to 21 per cent, also is unchanged at $33, furnace, subject to differentials on quantities larger than carloads. Special ferroalloys show only slight response to improved business sentiment.

Pittsburgh—Shipments of ferromanganese and spiegeleisen indicate no marked improvement in steelworks operations. Spot sales also are dull with prices unchanged at $103.79, delivered, for ferromanganese, and $33 for spiegeleisen. More strength is noted in tungsten ore. Ferrotungsten continues quiet at $1.10 to $1.15. Demand for other ferroalloys is light.

Semifinished Restricted To Spot Tonnages

Semifinished Prices, Page 96

Pittsburgh—Semifinished steel demand is limited to small lots, consumers showing no interest in future tonnages. Orders still reflect quietness in finishing mill operations. On current business $31 is quoted for rerolling billets, sheet bars and slabs, with forging billets taking the usual $5 premium.

Cleveland—Specifications for sheet bars, billets and slabs have increased slightly, enabling the leading merchant producer here to add another open hearth to its list of active units, five operating and nine idle. New business is quiet. Sheet bars, billets and slabs continue $31, base Cleveland and Youngstown.

Youngstown, O.—With a few more independent sheet mills getting under way this week, shipments of sheet bars to nonintegrated mills have picked up. Billets, sheet bars and slabs hold at $31, Youngstown and Pittsburgh.

Chicago—Semifinished sales have been slightly heavier during the week. A few fourth quarter contracts have been closed. Sheet bars, billets and blooms are quoted $32, Chicago.

Scrap

Improved Tone in Better Grades —Industrials Releasing Slowly —Prices Hold Fairly Steady

Chicago—Continued slow releases of the better grades of steel scrap by industrial producers are a brake to further price declines. Nevertheless, consumer bookings do not improve. The prolonged low market is being reflected in a restricted inflow of country scrap. Heavy melting steel is holding at $12.50, gross, as a top price, on the strength of the recent tonnage sale at $13, for delivery at Gary. Occasional sales illustrate the improved tone in the better grades. A sale of 500 tons of 2-foot rail ends has been made at $15, or 50 cents above the consumer price that has governed for many weeks. • Cupola grades are inactive. Foundry operations for the district remain at about 40 per cent. Speculative interest in the market still is shown, despite

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston, dealers	9.25 to 9.50
Buffalo, No. 1	13.00 to 13.75
Buffalo, No. 2	11.00 to 12.00
Chicago	12.25 to 12.50
Cinci., deal.	11.25 to 11.75
Cleve., No. 1	12.00 to 12.25
Cleve., No. 2	11.25 to 11.50
Det., No. 1 deal.	11.00 to 11.50
Det., No. 2 deal.	9.50 to 10.00
E. Pa. del. mill	12.50 to 13.00
N. Y. del. R. R.	9.00 to 10.50
N. Y. deal. No. 2	6.25 to 6.75
N. Y., deal. yd.	6.00 to 6.50
Pitts. No. 1	15.50 to 16.00
St. L. No. 1 sel.	11.50 to 12.00
Federal, Ill.	11.00 to 11.25
Granite C., Ill.	10.00 to 10.25
Valleys, No. 1	15.00 to 15.50

COMPRESSED SHEETS

Buffalo, dealers	11.25 to 11.50
Chicago	10.25 to 10.75
Cleveland	11.50
Detroit, dealers	11.00 to 11.50
E. Pa. new mat.	11.50
Pittsburgh	15.00 to 15.50
Valleys	14.50 to 15.00

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cinti., deal.	9.75 to 10.25
Cleveland	9.00 to 9.25
Eastern Pa.	9.50 to 10.00
Pittsburgh	13.00 to 13.50
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	7.75 to 8.25
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	11.00 to 12.00
Boston, dealers	7.50 to 8.75
Buffalo	16.25 to 16.75
Chicago (3 ft.)	13.50 to 14.00
Chicago (2 ft.)	14.00 to 14.50
Cinti., deal.	16.00 to 16.50
Detroit, deal.	15.00 to 15.50
Pitts. (open-hearth, 3 ft. and less)	17.50 to 18.00
St. Louis	14.00 to 14.50

STOVE PLATE

Birmingham	9.50 to 10.00
Boston, con.	8.50 to 9.00
Buffalo	10.25 to 10.50
Chicago, net	9.50 to 10.00
Cinci., deal. net	7.00 to 7.50
Det., net. deal.	9.00 to 9.50
Eastern Pa.	10.00
N. Y., deal. mill	6.00
St. Louis	9.00 to 9.50

COUPLERS, SPRINGS

Buffalo	16.00 to 16.50
Chicago	13.50 to 14.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	17.50 to 18.00
St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	11.75 to 12.25

LOW PHOSPHORUS

Buf., billets and bloom crops	17.50 to 18.00
Cleveland bil. and bloom crops	17.50
Eastern Pa.	17.50 to 18.00
Pitts. billet and bloom crops	20.00 to 21.00
Pitts. sheet bar crops	18.00 to 18.50

FROGS, SWITCHES

Chicago	13.00 to 13.50
St. Louis	12.00 to 12.50

SHOVELING STEEL

Chicago	12.25 to 12.50
Cleveland	8.50 to 8.75
St. Louis	11.25 to 11.50

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	7.50 to 8.00
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago, No. 1	11.25 to 11.75
Chicago No. 2	12.25 to 12.50
Cinti., No. 2	11.25 to 11.75
Eastern Pa.	14.00 to 14.50
N. Y., No. 1 di.	10.00 to 10.50
Pitts. No. 2	15.50 to 16.00
St. Louis, No. 1	9.00 to 9.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	7.00 to 7.50
Eastern Pa.	12.00 to 12.50
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	11.25 to 12.50
Chicago, No. 1	9.50 to 10.00
Cinn., No. 1 dl.	9.25 to 9.75
Cinn., No. 2	6.00 to 6.50
Cleve., No. 2	7.75 to 8.25
Detroit, No. 1 new deal.	9.50 to 10.00
St. L. No. 1	8.00 to 8.50
Val. new No. 1	13.75 to 14.25

MACHINE TURNINGS

Birmingham	7.50 to 8.50
Boston, dealers	4.00 to 4.35
Buffalo	8.25 to 8.75
Chicago	6.25 to 6.75
Cinn., deal.	6.25 to 6.75
Cleveland	7.00 to 7.50
Detroit	5.75 to 6.25
Eastern Pa.	9.00
N. Y., deal.	5.00 to 5.50
Pittsburgh	8.00 to 8.50
St. Louis	6.00 to 6.50
Valleys	10.50 to 11.00

BORINGS AND TURNINGS For Blast Furnace Use

Boston, deal.	3.10 to 3.60
Buffalo	9.25 to 9.75
Cinn., deal.	6.75 to 7.25
Cleveland	8.50 to 8.75
Detroit, deal.	6.00 to 6.50
Eastern Pa.	7.00 to 8.50
N. Y., deal.	4.00
Pittsburgh	9.00

CAST IRON BORINGS

Birming., chem.	12.00 to 13.00
Birming., plain	7.50 to 8.50
Boston, chem.	9.00 to 9.25
Boston, deal.	4.00 to 4.35
Buffalo	9.25 to 9.75
Chicago	7.50 to 8.00
Cinn., deal.	6.75 to 7.25
Cleveland	8.50 to 8.75
Detroit, deal.	6.00 to 6.50
Eastern Pa.	8.50 to 9.00
E. Pa. chem.	14.00 to 14.50
N. Y., deal.	4.50
Pittsburgh	9.00
St. Louis	6.00 to 6.50

PIPE AND FLUES

Cinn., deal	9.00 to 9.50

RAILROAD GRATE BARS

Buffalo	9.25 to 9.75
Chicago, net	8.50 to 9.00
Cincinnati	8.50 to 9.00
Eastern Pa.	10.50
N. Y., deal.	6.50 to 7.00
St. Louis	10.00 to 10.25

FORGE FLASHINGS

Boston, deal.	7.25 to 7.60
Buffalo	11.00 to 11.50
Cleve. ov. 10 in.	10.00 to 10.50
Detroit	9.50 to 10.00

FORGE SCRAP

Boston, deal.	6.00 to 6.50
Chicago	14.50 to 15.00
Eastern Pa.	11.50

ARCH BARS, TRANSOMS

Chicago, net	13.00 to 13.50
St. Louis	13.00 to 13.50

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	11.50 to 12.00
Chi. steelworks	9.50 to 10.00
Cleveland	11.75 to 12.00
Eastern Pa.	11.50 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	18.00 to 19.00
Bos., ship. pt.	16.50 to 17.50
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	21.00 to 21.50
St. Louis	16.00 to 16.50

SHAFTING

Bos., ship. pt.	13.50 to 14.50
Chicago	16.25 to 16.80
Eastern Pa.	18.50
N. Y., deal.	13.00 to 14.00
St. Louis	13.00 to 13.50

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.50 to 14.00
Buffalo, steel	16.00 to 16.50
Chicago, iron	13.50 to 14.00
Chi., roll steel	14.50 to 15.00
Cincinnati	12.00 to 12.50
Pitts., iron	15.00 to 15.50
Pitts., steel	17.50 to 18.00
St. Louis iron	12.00 to 12.50
St. Louis, steel	13.75 to 14.25
E. Pa. steel	16.75 to 17.00
E. Pa. iron	14.50 to 15.00

NO. 1 CAST SCRAP

Birming., cup	11.50 to 12.00
Buffalo (mac.)	12.50 to 13.00
Boston, textile	11.50 to 12.00
Chicago, mach.	13.45 to 14.00
Chi., railroad	11.20 to 11.75
Chicago, agri.	10.90 to 11.50
Cinn., mach. cup., gross	14.50 to 15.50
Cleve. cupola	13.50 to 14.00
Det., net deal	10.00 to 10.50
E. Pa. cupola	13.50
N. Y. cup. deal.	9.50 to 9.75
N. Y., del. local foundries	14.00
Pitts. cupola	14.00 to 14.50
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	11.00 to 11.50
St. L. No. 1	10.00 to 10.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. Mach. cast.	13.50 to 14.00
Buffalo, break.	8.50 to 9.00
Cleve., break	8.50 to 9.00
Detroit, auto, net deal.	11.50 to 12.00
Det., break., dl.	7.00 to 7.50
Eastern Pa.	11.50 to 12.50
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	8.25 to 9.10
Pittsburgh	11.50 to 12.00

MALLEABLE

Boston R. R.	15.00 to 15.50
Buffalo	15.00 to 15.50
Chicago, agri.	11.75 to 12.25
Chicago, R. R.	13.50 to 14.00
Cinn., R. R. dl.	12.50 to 13.00
Cinn., agri. dl.	1250 to 13.00
Cleve., rail	15.50 to 16.00
Det. auto deal.	13.50 to 14.00
St. Louis, rail	10.00 to 10.50

RAILS FOR ROLLING 5 feet and over

Birming. cup.	12.00 to 12.50
Boston	9.00 to 9.50
Buffalo	13.50 to 14.00
Chicago	14.50 to 15.00
Eastern Pa.	13.00 to 13.50
New York	9.50 to 10.00
St Louis	12.75 to 13.25

LOCOMOTIVE TIRES

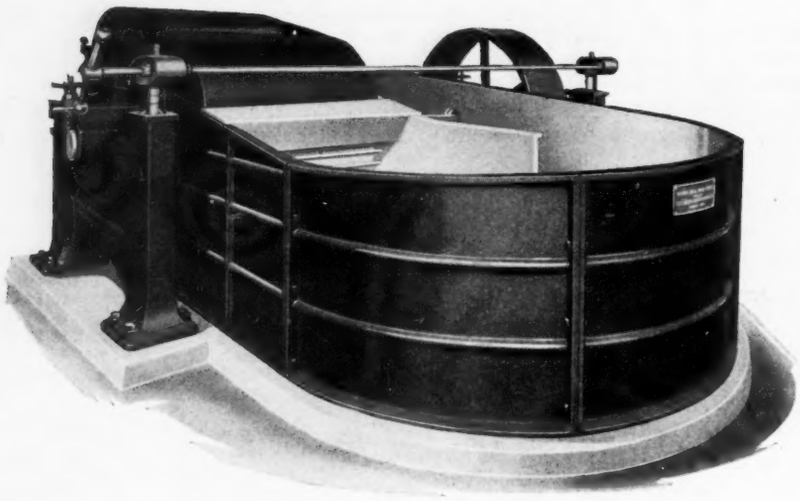
Chicago, cut	15.00 to 15.50
St. L. No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.00 to 13.50
Pittsburgh	17.50 to 18.00
Eastern Pa.	17.00 to 18.00
Buffalo	17.00 to 17.50

DAYTON BEATER ROLL

Castings by COMMERCIAL

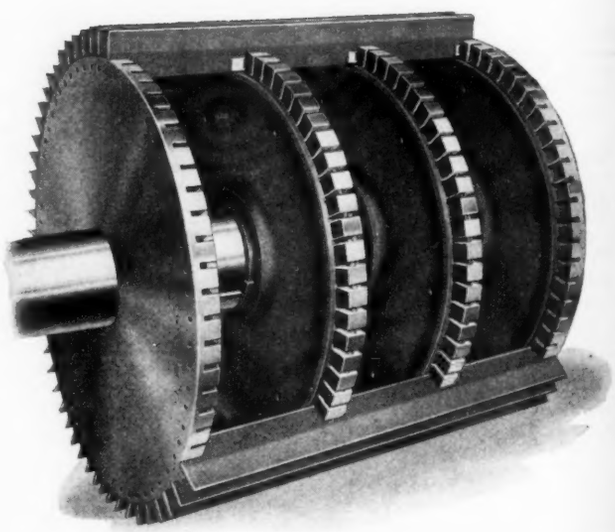


Dayton High Speed Beater for the secondary treatment of fibre pulps used in the making of paper, manufactured by The Dayton Beater and Hoist Company, Dayton, Ohio.

The Beater Roll is the most important unit in a paper pulp beater. When working with heavy densities the strain on the revolving beater roll is terrific. Every caution must be taken to prevent costly breakdowns and production hold-ups.

For this reason The Dayton Beater and Hoist Company use cast steel heads on all Dayton beater rolls that are designed to handle heavy grades of stock.

These steel roll heads are cast by The Commercial Steel Casting Company. The splendid trouble-free service Dayton High Speed Beaters are giving in leading paper mills of the country is ample evidence of the quality and unusual strength of Commercial castings.



THE COMMERCIAL STEEL CASTING CO.

Subsidiary of The Osgood Company

MARION, OHIO

Sales Offices

416 First National Bank Bldg. Cincinnati, Ohio	1002 Tribune Bldg. New York City	1623 Conway Bldg. Chicago, Ill.	Fisher Bldg. Detroit, Mich.	620 National Bldg. Cleveland, Ohio

dealers' efforts to work off short accounts.

Boston—Scrap prices continue firm and a better prospect seems ahead for a larger shipment and higher price range. Dealers and brokers are unanimous in their viewpoint that the market has scraped bottom and is on the uptrend. How soon this appreciation will manifest itself remains to be seen, but price firmness for five weeks and low accumulations in practically all lines tend to bring about the feeling that the worst has been seen. Heavy melting is a shade firmer.

New York—Fresh demand for scrap continues slack and prices are unchanged. It is believed that anything like a sizable tonnage would bring increase in prices on most major grades. Production is not large.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$15.00
Steel axles	13.00
Car wheels	11.00
Stove plate	10.00
Wrought pipe	5.00
Turnings	6.00
Heavy melting steel	8.00

TORONTO

Steel axles	10.00
Iron axles	12.00
Heavy melting steel	9.00
Turnings	6.50
No. 1 mach. cast (net)	11.00
Malleable (net)	9.00

Philadelphia—Scrap trading is restricted to small tonnages and is small in total sales. Force flashings have sold off 50 cents. There have been several small sales of heavy melting steel unchanged at $10.50 to $11.

Pittsburgh—Scrap is maintaining strength in a dull market. Scarcity of heavy melting steel is reflected in reported price of $16.25 paid on Pennsylvania railroad list, or 50 cents higher than a month ago. Little material is available at less than $15.50 and this grade is quotable at $15.50 to $16. Compressed sheets remain in a nominal market. Blast furnace material is stronger at $9.

Buffalo—There is wide range among dealers with respect to scrap values. Some fix $13 as the best bid they can make for No. 1 heavy melting steel, while others say railroad lists came here at $13.75 to $14. No. 2 is quoted similarly at $11 to $12 in nominal lists. Republic's purchase at the latter price was noted recently. Even wider are the ranges of quotations on machine shop turnings. Sales have been small.

Cleveland—Demand for iron and steel scrap shows no improvement in the Cleveland district. Both steelworks consumers here continue out of the market and are likely to remain so in view of present prospects. One is receiving sufficient material from its railroad source to supply current needs. Operations of the other are at a low point. Both have heavy stocks. Prices are nominal in absence of trading. Blast furnace scrap is abundant and in slack demand. Borings and mixed borings and turnings are now $8.50 to $8.75. Forge flashings are strong.

Cincinnati—Weakness in scrap iron has caused dealers to cut bids while heavy melting steel remains firm and in demand. A light scrap list of the Southern railroad is current. No. 1 machinery cast is off $3, $14.50 to $15, with railroad cast, cast iron borings and several other grades lower.

St. Louis—Due chiefly to moderate supplies in practically all positions, the scrap iron and steel market exhibits a decidedly firm undertone. Dealers are firm in their views and are not accepting prices offered by producers. Buying now is limited, but the small tonnages changing hands are bringing full list quotations. The railroads are also getting stiff prices, frequently more than smelters are paying for the identical material. Dealers with contracts to fill are in some instances experiencing difficulty in obtaining grades they desire. As for sometime little country scrap is arriving. It is pointed out, however, that the crop failures and drouth will give farmers spare time for collecting farm scrap and hauling it to terminals. This material will sell at low prices, and may result in increased shipments in the autumn. Some surplus of blast furnace material has developed.

Birmingham, Ala.—Heavy melting steel is quoted at $10.50 and $10.75 to $12, with concessions heard of on latter price. Dealers report plenty of stock obtainable and melters are buying only against early needs. Consumers are watching stock in yards, keeping up with their pace of production. Delivery of old material is without delay.

Toronto, Ont.—Buying in small quantities continues the feature of iron and steel scrap sales. Mills are accumulating supplies direct from the railways, but are buying in a conservative manner from dealers on spot needs. The movement of heavy melting steel and turnings continues light, both here and at Montreal. Foundries and other consumers of iron scrap adhere to hand-to-mouth buying.

Coke

Market for Furnace Fuel Shows More Firmness as Surplus Is Cut—Domestic Sizes in Demand

COKE PRICES, PAGE 96

Pittsburgh—Activity in the beehive coke market is confined to domestic sizes, demand for which is beginning seasonal improvement. Furnace fuel continues quiet, in the spot market and with respect to shipments. Blast furnace operations require only small tonnages. With little surplus coke available producers are holding to $2.60 for spot orders. Foundry coke price are steady, but demand is slow to improve.

Beehive coke production in the Connellsville district during the week ended Aug. 30, was 17,110 tons, against 19,390 tons the preceding week and 80,600 tons the corresponding week of last year, according to the *Connellsville Courier*.

Boston—Shipments of coke on contracts show a slight increase, but new sales are few and small. Prices are unchanged.

New York—Slightly more activity is noted in furnace coke, and distress sales are less frequent. Standard grades of beehive furnace coke are firmer at $2.60 to $2.75, Connellsville. Standard beehive foundry coke is unchanged at $3.50 to $3.75, Connellsville, and premium brands $4.85, Latrobe. By-product foundry coke is $9 to $9.40, delivered Newark, N. J.; $11, New England; and $9, Philadelphia.

Cincinnati—Improvement is reported in demand for by-product foundry coke. Prices are unchanged.

Birmingham, Ala.—The market for coke shows little change and oven operations are steady. Foundry fuel is held at $5, base, Birmingham.

St. Louis—Specifications for coke have improved moderately, due to small consumer stocks. Foundries anticipated a larger demand for castings this fall.

Pacific Coast

Small Orders Predominate in Northwestern Market, Though Outlook Is More Promising—Public Works Awards in August Best in Three Months—Figure Several Large Projects

Seattle — Relatively unimportant tonnages have featured the Pacific Northwest iron and steel market during the week. However, several fair size jobs are pending and considerable new work is developing. Awards of the week approximated 1000 tons. Prices are firm. With a total of $3,363,038 in public works awards, August proved the best of the last three months. Seattle's August construction totals were $1,567,255, compared with $1,922,295 in August, 1929. For the first eight months of 1930 Seattle shows a total of $19,815,115. In the corresponding 1929 period the total was $23,812,815.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Bars, Plates and Shapes

The outlook is somewhat improved as several important projects are to be up soon. The dam at Rock Island, Wash., will require 2500 tons of reinforcing steel. Pacific Coast Steel Co., Seattle, closed for 140 tons for the Eyres warehouse, Seattle. Northwest Steel Rolling Mills, Seattle, was awarded the contract for 100 tons for the Monitor bridge, Chelan county. Johnson Bros., Seattle, have the contract to build the government immigration and customs station at Blaine, Wash., on a bid of $126,000. Reinforcing material totals 55 tons. Bids will be received until Sept. 10 by Pacific Great Eastern railroad. Vancouver, B. C., for the substructure of a bridge to cross the Fraser river. About 30 tons of reinforcing steel is required.

Seattle city council has appropriated $2,000,000 to build a 66-inch aqueduct for the city water system and plans will be prepared promptly. Vancouver Engineering Works Ltd., and Vulcan Iron Works Ltd., Vancouver, B. C., are using an unstated tonnage of plates in constructing a treating cylinder, and storage tanks for the Vancouver Creosoting Co. Ltd., Vancouver. This plant is spending $150,000 in extensions and additional equipment. A large incising machine is being supplied by the Maple Leaf Iron Works Ltd., Vancouver.

Demand for shapes in August showed a gain over July. Not many important projects are up for immediate figures. Awards this week included 125 tons for the Great Northern railroad bridge at Colebrook, B. C., awarded to the Western Bridge Co. Ltd., Vancouver. Pacific Car & Foundry Co., Seattle, will build the Acme bridge for Whatcom county, Wash., requiring 100 tons of shapes and castings. Union Bridge Co., Portland, Oreg., is low bidder for the Hoh river bridge, Jefferson county, Wash., requiring 300 tons of shapes. Mill prices remain unchanged with reinforcing at 2.30c, shapes and merchant bars, 2.25c, and plates firm at a minimum of 2.15c.

Pipe Awards Are Small

The only cast iron pipe award of the week is for 190 tons of 16-inch class B for Thirty-fifth avenue N. E., Seattle, awarded to French manufacturers by local contractors, Grants Pass, Oreg., will open bids Sept. 18 for 45,000 feet of various sizes of cast iron pipe.

Old Materials

While steel scrap remains unchanged at $9.50 to $11, gross, at local mills, the quality of materials is considerably improved due to more careful selection by buyers. Receipts are in excess of present consumption. The navy department will open bids Sept. 25 for the sale of the MISSOULA and CHARLOTTE at the Puget Sound navy yard, estimated to contain between 15,000 and 20,000 tons of steel.

Awards More Numerous

San Francisco—*(By Air Mail)*—Demand for iron and steel products on the Pacific coast has improved moderately during the past two weeks. Dyer Bros. booked 400 tons of shapes for a plant at Pittsburg, Calif., for the Stockton Firebrick Co., and the Pacific Coast Steel Corp. took 1000 tons of concrete bars for a plant in Seattle for the American Can Co.

Bars, Plates and Shapes

Movement of concrete bars continues well sustained. Awards this week aggregated 2333 tons, bringing the total for the year to 44,635 tons, compared with 60,299 tons for the corresponding period in 1929. The Pacific Coast Steel Corp., booked 307 tons for Hale Bros. store in San Jose, Calif. An auditorium in Claremont, Calif., went to an unknown company. Included among the new inquiries were 134 tons for two bridges in Alameda County, Calif., 200 tons for a baseball park in San Francisco, and 200 tons for an office building in Los Angeles. No change in out-of-stock quotations in the San Francisco district has occurred recently, 2.50c, base, being firm for carload lots.

Awards for plates are restricted to small lots. Prices range from 2.15c to 2.25c, c.i.f. Demand for structural shapes is well sustained. Awards totaled 1606 tons and brought the aggregate for the year to 82,324 tons, compared with 135,405 tons for the same period a year ago. The Pacific Iron & Steel Co. booked 575 tons for an auditorium in Claremont, Calif., and the Kansas City Structural Steel Co. took 350 tons for a smelter stack at Douglas, Ariz., for the Calumet & Arizona Mining Co. New bids will be opened Sept. 30 for 1800 tons for the State building, Los Angeles, former bids having been rejected. Bids will be opened Sept. 22 for 205 tons for a bridge for the highway department, Phoenix, Ariz. No change in plain shapes is noted, 2.15c to 2.25c, c.i.f. being general.

Some improvement in demand is seen in the cast iron pipe market, although awards this week were not particularly heavy. The Pacific States Cast Iron Pipe Co. took the only award in excess of 100 tons. This called for 338 tons of 2-inch pipe for Los Angeles. This city will open bids Sept. 11 for 1577 tons of 8 to 12-inch class 150 pipe. Oakland, Calif., will open bids Sept. 24 for 2022 tons of 4 to 8-inch class B and centrifugal pipe. San Diego, Calif., has opened bids on 189 tons of 2 to 8-inch class C pipe for the improvement of 54th street. Little improvement in demand for standard steel pipe and oil country goods is reported.

Army Buying Tin Plate

New York—Bids go in Sept. 12, chemical warfare division, Washington, on 19,785 sheets of tin plate for the Edgewood Arsenal, Md., and Sept. 15, on 5000 sheets.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2 points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal.
⅛	58	44½	⅛	23	5
¼	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13	+48
¾	60	49½	½	23	7
1—1½	62	51½	¾	28	12
2—3	63	52½	1—2	34	18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

SEAMLESS TUBING

Cold drawn; f.o.b. mill

Random lengths over 5 ft.....55%
Selected lengths, 1 to 18 ft.....53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir.	$37.00 to 38.00
Four-inch, Birmingham	41.00 to 42.00
Four-inch, Chicago	49.20 to 50.20
Six to 24-inch, Chicago	45.20 to 46.20
Six-inch and over, N. Y.	38.50 to 40.50
Four-inch, New York	41.50 to 42.50
Stand. fittings, Bir. base	$100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher. Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los. Ang.	3.40c
New York††	3.10c
Philadelphia	2.70c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.15c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York††	3.10c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFOR. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	2.30c-3.00c
Houston	3.00c
Los Ang. cl	2.40c
Los Ang. lcl	2.70c
New York	2.65c-3.10c
Philadelphia	2.55c
Pittsburgh	2.75c
San Fran. cl	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.40c
New York	3.10c
Philadelphia	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
New York	3.40c
Portland	4.00c
Phila. *†	3.15c
Pitts.**	3.10c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.545c
Tulsa	3.95c

NO. 24 BLACK

Balt. *†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev. ***	3.75c
Detroit	3.95c
Los Ang.	4.70c
New York	3.55c to 3.65c
Phila. *†	3.70c
Pitts. **	3.65c
Portland	5.00c
San Fran.	4.35c
Seattle	5.00c
St. Louis	4.25c
St. Paul	3.79c
Tulsa	4.45c

NO. 24 GAL. SHEETS

Balt.*†	4.25c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (lc. del.)	4.35c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.40c
Houston	5.40c
Los Ang.	5.10c
New York	4.25c
Phila. *†	4.25c
Pitts.**	4.20c
Portland	5.50c
San Fran.	5.00c
Seattle	5.50c
St. Louis	4.85c
St. Paul	4.58c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York	3.40c
Philadelphia	3.00c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.35c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.25c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.90c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San. Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted. (a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100-in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c)	4.75c
New York	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

††Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time.

WEST STEEL
QUALITY SERVICE

BETTER STEEL CASTINGS

Where the Job Is Toughest!

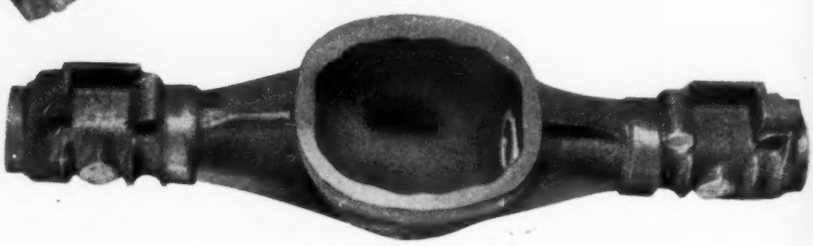
To withstand the gruelling test of constant strain and frequent abuse it has been necessary for manufacturers to select their sources of supply with the utmost care.

To WEST STEEL has been entrusted the establishment and maintenance of the high standards of quality in many nationally known products.

Thus they are assured that their cast steel parts will continue to stand up *where the job is the toughest!*

Have you some part that is causing you trouble? Let us show you what WEST STEEL can do for you.

We specialize in light steel castings in production quantities.



We solicit your inquiries

THE WEST STEEL CASTING CO.
Cleveland, Ohio

Mill Products

Base price cents per pound f.o.b. mill, except otherwise specified. Copper and brass product prices based on 11.00c, del., Conn. for copper

Sheets	
Yellow brass (high)	17.87½
Copper, hot rolled	20.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	22.75
Seamless copper	23.00
Rods	
Yellow brass (high, full turnings)	16.12½
Naval brass	19.00
Anodes	
Copper, untrimmed	18.25
Wire	
Yellow brass (high)	18.37½

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.25 to 7.50
Chicago	7.00 to 7.50
Cleveland	8.00 to 8.25
St. Louis	7.75 to 8.00
Heavy Yellow Brass	
Cleveland	5.00 to 5.25
Heavy Copper and Wire	
New York	8.50 to 8.75
Boston	8.50 to 8.75
Chicago	8.75 to 9.00
Cleveland	8.00 to 8.25
St. Louis	8.25 to 8.50
Red Brass Borings	
New York	6.75 to 7.25
Yellow Brass Tubing	
Cleveland	5.00 to 5.50
Light Copper	
New York	7.00 to 7.50
Chicago	6.75 to 7.00
Cleveland	7.00 to 7.50
St. Louis	8.00 to 8.25
Light Brass	
Boston	4.00 to 4.25
Chicago	4.50 to 5.00
Cleveland	3.50 to 4.00
St. Louis	4.50 to 4.75
Zinc	
New York	2.25 to 2.50
Cleveland	1.75 to 2.00
St. Louis	2.25
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clipp'gs, hard, Cleveland	9.00 to 9.50
Borings, Cleveland	5.00 to 5.50
Cast, Cleveland	7.50 to 8.00
Cast, Boston	7.00 to 7.50
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	14.00 to 15.00
Brass ingot, 85-5-5-5	11.00

Quicksilver Holds Easy

New York — Quicksilver is unchanged but easy at $117 to $118 for small lots of spot.

Metals

Larger Sales Awaited as Vacation Period Closes—Prices Steady—Tin Supplies Increase

New York—Metal markets are confident that business is on the threshhold of larger tonnage. Consequently, prices have held firmly through another week of dullness. New orders continue small, but the markets are watching closely such news items as slightly improved operations by the steel mills and radio manufacturers and larger carloadings.

Copper—Business has been done in the past week again at both 10.75c and at 11.00c, Connecticut, but in the past few days nearly all of the business has been at the higher price. This appearance of firmness gives a little encouragement to the market but it is generally feared that it is only a passing phase. So far as can be seen no fundamental change has occurred to prevent the custom smelters from occassionally becoming anxious sellers, and on these occasions they are likely to dip below 11.00c in order to insure quick moving of at least part of their intake. Users could not possibly get enough copper at the lower figure to maintain operations, and so the higher figure is generally regarded as base

Zinc—Prime western has continued dull at 4.30c for more than a week. Some of the largest sellers have not been meeting this price, especially for forward shipment, but sufficient metal has been available to take care easily of all that has been wanted. In the past day or two there has been little test of the market. The ore market is unchanged at $31 a ton. Despite an increase of 3500 tons in shipments of zinc in August, stocks went up 5300 tons. Shipments last month were 35,775 tons, but despite the increase for the month they remained about 15,000 tons smaller than the average for last year. August shipments were about 70 per cent of last year's average. Stocks now total 122,635 tons. August sales were the lightest since last November, and were especially light on futures.

Tin—Consumer buying has been light so far this month, and the speculative market has been extremely quiet. But the price has been remarkably steady around 29.75c. Curtailment has made considerable progress, and it is believed that it will show up more effectively in statistics this autumn, but the market seems to need an actual improvement in consumer demand to give it even mild strength.

Lead—New business continues to be confined to a few carlots for prompt shipment. Producers feel sure however, that users need to buy more lead for September and much more for October, so they have been firm in their prices.—*Daily Metal Trade.*

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	0.04½ to 0.05½
Naphthalene balls	0.05½ to 0.06½
Per 100 Pounds Delivered	
Sulphate of ammonia	$1.80

Coke By-Products More Active; Phenol Stronger

New York—Distillate prices are unchanged, but firmer. Most low priced material has been moved. Production is slower and stock is not accumulating. Demand is moderately good. Toluol is active, although the automobile industry is not taking its usual quota. Demand for industrial lacquer has picked up. Benzol is fairly active. Zylol and solvent naphtha have shared in the improvement. Phenol is dull. The bulk of business is moving at 17.00c, with St. Louis 1 cent lower. Naphthalene sales are limited to spot lots.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead New York	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Sept. 3	10.87½	11.12½	10.75	29.70	30.12½	5.50	5.35	4.30	22.90	7.87½	35.00
Sept. 4	10.87½	11.12½	10.75	29.65	30.05	5.50	5.35	4.30	22.90	8.12½	35.00
Sept. 5	11.00	11.12½	10.75	29.70	30.10	5.50	5.35	4.30	22.90	8.00	35.00
Sept. 6	11.00	11.12½	10.75	29.70	30.10	5.50	5.35	4.30	22.90	8.00	35.00
Sept. 8	11.00	11.12½	10.75	29.75	30.12½	5.50	5.35	4.30	22.90	8.00	35.00
Sept. 9	11.00	11.12½	10.75	29.87½	30.25	5.50	5.35	4.30	22.90	8.00	35.00

Europe

British Industry Expecting Improvement in Fall—Sharper Competition from Continent

Birmingham, Eng.—Autumn revival of business, after the seasonal lull of summer and the holiday period, is awaited by producers of iron and steel. Some signs indicate a betterment in conditions but progress so far has been slow. Accumulation of orders during the idle time of the holidays has given some semblance of increased activity but it is impossible to measure the actual improvement until these have worked off. Orders of this sort have been somewhat disappointing and have not furnished works as much occupation as had been expected.

Steel continues to feel aggression of Continental makers, especially in rerolling lines. Domestic prices on small bars is low but imported material can be delivered at much below this level. In some cases foreign steel is available at £2 below the British minimum. The rebate arrangement protects structural steel to a great extent and the spread is much less.

Expectations are that shipbuilding requirements will cause distribution of useful tonnages soon, which will aid the situation to some extent. Railway material also promises an increase and these are relied on to give some relief. Prospective construction is on the boards of engineers and is likely to eventuate soon in constructional tonnages.

Pig Iron Is Unsettled

The pig iron situation is unusually dull. Blast furnaces were damped down to considerable extent, contrary to the usual custom of continuing production uninterruptedly. Recent reduction of 4s in prices of Middlesbrough pig iron was greater than had been expected by consumers, but has not resulted in much increase of buying. Some expiring contracts have been renewed. Present prices seem likely to curtail the use of other grades of iron in the Middlesbrough district, although concessions in railway rates from the Midlands have given iron from there a better entry. Similar concessions for Middlesbrough iron have not yet been obtained.

Heavy stocks are a burden to East coast hematite makers, though much of this is already sold and awaiting releases for shipment. Present small output is fairly balanced with current needs and accumulations are not being increased much. A better balance of prices between the Midlands and Middlesbrough is now in effect, close to that existing before the war.

Consumers of Midland iron show some tendency to buy ahead, but the situation is not sufficiently clear to cause this to be done freely. Revision of prices several weeks ago by the Central Producers association anticipated the recent reduction on Middlesbrough iron and no reaction has followed. Orders are for small lots of hematite and usually for immediate delivery in most instances.

In Scotland trade is slow, especially in export lines. Most foreign markets are in a situation indicating slow return to usual conditions. Somewhat better inquiry is noted in domestic lines in iron and steel, but the change is not sufficient to give a definite appearance of improvement. Bar iron and rerolled steel bars and sections are being taken in moderate volume but in heavy steel products specifications are lacking.

Scotch pig iron is dull and there appears no likelihood that more stacks will be blown in, only 12 now being in blast, an unusually small number for this district. Prices have not been changed but reductions in other areas may force a lower price in Scotland.

Scrap is slow and prices are weak, though accumulations are not burdensome. Reduced steelmaking has cut off the outlet for discarded material but lessened industrial fabrication of steel has lowered production of scrap.

Foreign ore is being imported in smaller volume and rubio, Spanish ore, has been reduced 1s per ton. Blast furnace coke is in small demand and prices are weak.

Fall in Continental Prices Affecting British

London — (*By Radio*) — Lower continental iron and steel prices are affecting the Midland market. British makers being unable to meet them, except for pig iron. Middlesbrough producers report slightly more inquiries. Automobile builders are preparing for larger operations in October. A Sheffield company has obtained a substantial order for railroad tires for delivery to South Africa. Tin plate demand is quiet, and the market for galvanized sheets is dull.

The release of price control over semifinished steel and structural shapes by continental comptoirs means the virtual collapse of these organizations, as production control is all that remains to them. All prices are falling, buying practically having stopped, due to expectations of further reductions.

Present prices are not remunerative, and the bottom is expected to be reached soon. The future of the European steel entente now is uncertain. A slight increase in demand for steel bars is noted in Belgium, while conditions in France are unchanged. Berlin reports exports of bars and beams at higher prices than offered by Belgians. Twenty locomotives for delivery to Egypt have been booked by a German builder.

Belgian Market Sees Better Tendency in Steel

Brussels—It appears that the trend of export transactions has changed a little. Since two weeks ago the tendency is better and a certain firmness has been reported in some branches of the metallurgical market, but it is too early to say that an upward move will follow, as orders are not numerous enough to encourage buyers who are always hesitant.

Quoted prices are the lowest since 1913 for some commodities. The Belgian railways have placed an order for 35,000 tons of rails of which 25,000 tons will be manufactured in Belgium, and 10,000 tons in Luxemburg. It is expected that rolling stock and railway materials will be ordered when the 600 million loan has been accepted by the Belgian chamber of representatives.

Nothing new has developed concerning the international sales organization for semiproducts and beams, but it seems that many difficulties are encountered in England, where merchants are not satisfied with the decisions which forbid sales otherwise than to consumers. On the other hand, prices fixed for semiproducts are too near those quoted for bars and it is almost impossible

ACME

Hot and Cold Rolled Strip
Electro Galvanized Strip

....

Long Length Coils
or Cut-to-Length

1880 ACME STEEL COMPANY 1930
OUR GOLDEN ANNIVERSARY

General Offices: 2840 Archer Avenue ... Chicago

BROOKLYN DETROIT MILWAUKEE SAN FRANCISCO

STEEL

to sell semiproducts sometimes.

As a consequence of the drop in prices of rolled bars, prices of semiproducts for the home trade have fallen by 60 francs a ton for blooms and billets, and by 40 francs a ton for sheet bars.

Generally speaking, works are not inclined to grant any option on the actual prices and for orders specified within a month or two an extra 1s is applied to the price of bars. Bars sold for immediate delivery are £4 7s 6d.

Rods are quoted at £4 10s, but orders are rare. Wire rod is in its previous situation. The state of affairs in this branch is dull and mills are working at 60 per cent capacity. Wire products are much depreciated and orders for export are not numerous. The Chinese and Indian markets are inactive, due to political difficulties.

Prices of scrap have increased as a consequence of licenses to export scrap to Poland that have been recently granted for a heavy tonnage.

Construction of residential and industrial buildings is quiet, consequently beams and profiles are not easily sold. It is said that Hadir, the Luxemburg metallurgical concern, has reduced its output of grey beams by a high percentage. Its principal market was Germany and prevailing dullness in that country was the cause of this reduction.

German Orders and Production Lose Ground

Berlin—The situation in the German iron market has continued to deteriorate during recent weeks. Both domestic and foreign orders are booked at a very unsatisfactory rate, while competition is keen. Nevertheless, one plant after an other has to cut down production and to reduce its staff. The Thale iron plant is asking authorities for permission to give notice to 1700 workers. the Gute Hoffnungs-Hutte is operating only three out of its eight blast furnaces, the Van der Zypen and Wissen Co., is to dismiss 250 workers. Out of 173 blast furnaces only 77 were operating at the end of July, compared with 79 a month ago. Pig iron output has fallen to 770,928 metric tons in July, compared with 1,203,794 a year ago. As to crude steel, July production totaled only 905,763 metric tons, against 1,465,544 tons in July, 1929.

Look To Further Decline

There are few indications of early improvement but, on the contrary, a further decline is looked for. Export business has developed at an unsatisfactory rate, foreign, especially Belgian producers, underquoting German prices. Merchant bars are maintained by German works at about £4 10s 6d, but it is expected that these prices also will have to be reduced shortly. Structural shapes are quoted above this level, at about £4 13s. Sheets and plates are offered substantially. Exports to South America are meeting increasing competition from the United States. Some sales were recently made to the far East, but business with these countries is suffering. The $10,000,000 business with Turkey has now been contracted. It includes among other items 70,000 metric tons of rails, further material for permanent way, 1500 railway cars, and 30 locomotives, and most deliveries are to be made in 1933-34.

Apart from a possible seasonal recovery in the fall, the domestic outlook is not promising. It is true that railways have increased their monthly orders for the permanent way, especially for rails, from 20,000 to 50,000 tons. In ordinary times, however, these orders totaled 80,000 tons. The orders for locomotives are reduced to about 15 per cent of normal. With regard to the machine industry, the second largest domestic consumer, it must be mentioned that it is working at only 57 per cent capacity and orders are coming in slowly. The amounts invested in the building trade will be this year at least 1,400,000,000 marks or 15 per cent smaller than in 1929. The shipyards have to do less than ever, while the automobile industry and hardware makers complain about decreasing orders. Last, but not least, farmers are suffering from the agricultural crisis and thus are scarcely important buyers. Domestic iron prices are maintained unchanged.

Reduce Coal Wages in Ruhr

Ruhr coal producers have given notice to the existing wage agreement effective Sept. 30, aiming at reducing wages by about 10 per cent and coal prices by about 1 mark per metric ton. The miners will strongly oppose this reduction, but economic facts must finally be stronger. Coal stocks in the Ruhr district so far have accumulated to 8,500,000 metric tons.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, September 8	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$15.43	3 3 6	$13.37	2 15 0	$13.37	2 15 0	$13.37	2 15 0
Basic-bessemer	15.92	3 5 6	12.88	2 13 0	12.88	2 13 0	13.37	2 15 0
Hematite, Phosphorus 0.02-0.05	17.25	3 11 0	24.76	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$27.95	5 15 0	$18.83	3 17 6	$18.83	3 17 6	$19.08	3 18 6
Wire rods	41.31	8 10 0	30.38	6 5 0	30.38	6 5 0	31.60	6 10 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.60	6 10 0	$31.60	6 10 0	$32.08	6 12 0
Merchant bars	1.68c	7 15 0	.95c	4 6 0	.95c	4 6 0	.99c	4 10 0
Structural shapes	1.68c	7 15 0	.94c	4 5 0	.94c	4 5 0	1.00c	4 11 0
Plates, ship, bridge and tank	1.79c	8 5 0	1.13c	5 3 0	1.13c	5 3 0	1.30c	5 18 0
Sheets, black, 24 gage	2.17c	10 0 0	1.95c	8 17 6	1.95c	8 17 6	1.98c	9 0 0
Sheets, galvanized, 24 gage, corrugated	2.47c	11 7 6	2.46c	11 3 9	2.46c	11 3 9	2.42c	11 0 0
Bands and strips	2.17c	10 0 0	1.10c	5 0 0	1.10c	5 0 0	1.29c	5 17 0
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.65c	7 10 0	1.65c	7 10 0	1.67c	7 12 0
Wire nails, base	2.39c	11 0 0	1.38c	6 5 0	1.38c	6 5 0	1.49c	6 15 0
Tin plate, base box 108 pounds	$ 4.38	0 18 0	.....	.....	.....	.....	$ 8.75	1 16 0

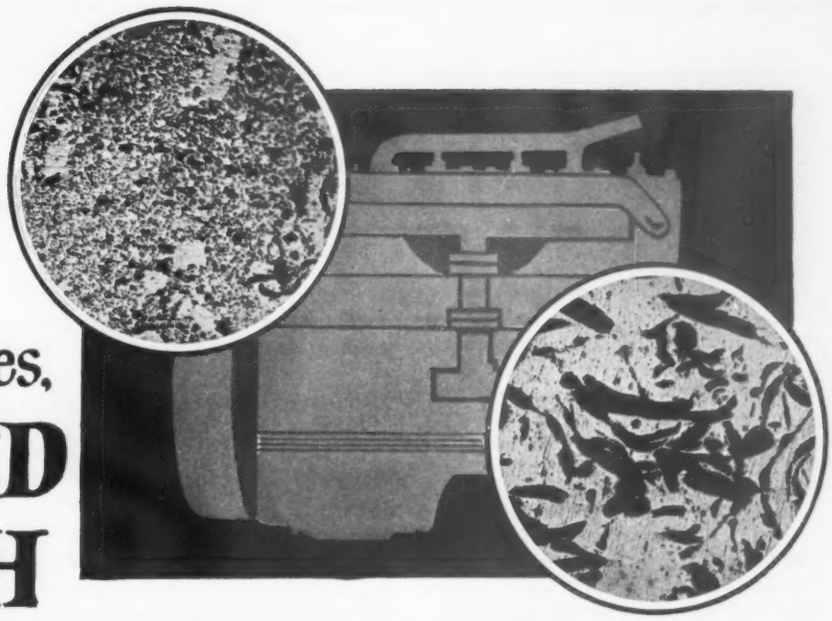
*France

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$15.43	3 3 6	$19.26	490(2)	$16.74	600	$19.79	83
Basic pig iron	15.92	3 5 6	20.63	525(1)	13.39	480	21.09	88.50
Furnace coke	3.28	0 13 6	6.60	168	5.71	205	5.13	21.50
Billets	28.80	5 18 6	22.20	565	19.25	690	28.01	117.50
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.47c	136
Merchant bars	1.74c	8 0 0	1.18c	655	1.03c	790	1.48c	137
Shapes	1.84c	8 10 0	1.26c	700	1.18c	910	1.45c	134
Plates, ship, bridge and tank	1.95c	9 0 0‡	1.46c	810	1.33c	1,025	1.65c	153
Sheets, black, 24-gage	2.28c	10 10 0	2.72c	1,510	2.54c	1,950	1.36c	126
Sheets, galvanized 24 gage, corrugated	2.58c	11 17 6	3.52c	1,955	2.60c	2,000	3.67c	340
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.34c	217
Bands and Strips	2.17c	10 0 0	1.33c	740	1.43c	1,100	1.72c	153

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 0s 0d ($58.32) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel, French, Belgian, Luxemburg, and German are for basic-bessemer steel.

See—



with your own eyes, INCREASED STRENGTH in CHARCOAL IRON CASTINGS

Castings in which a percentage of Superior Charcoal Pig Iron is used, are stronger, denser, and tougher without corresponding increase in Brinell hardness. This promotes easier machining with better results—eliminating rejections due to hard spots or other physical structural weaknesses.

Write for a copy of the booklet, "Superior Charcoal Pig Iron." — It gives the history, characteristics, uses and grades of Superior Charcoal Pig Iron and contains other valuable information on iron castings.

The micrographs (in the circles above) tell why. The upper circle shows a micrograph of Superior Charcoal Pig Iron. Notice that the graphitic flakes are very small and nodular (knot or hook-shaped) in form. This structure provides greater strength. In ordinary pig iron (micrograph in lower circle) these flakes are coarse, large and straight, contributing decided weak spots.

In Superior Charcoal Pig Iron both combined carbon and graphitic carbon are more firmly enmeshed, more evenly distributed and properly balanced. This imparts to the structure of castings better continuity of these elements, therefore greater transverse and tensile strength.

Such definite assurance of better quality and less rejections and losses far out-balances the slight additional cost in the cupola mixture (5c to 6c per 100 pounds for 20% Charcoal mixture).

Many other desirable qualities peculiar to Charcoal Iron Castings may prove advantageous to your product. Let us study your problem with you, to determine the advisability of using Superior Charcoal Pig Iron in your castings.

SUPERIOR CHARCOAL IRON CO.

GRAND RAPIDS • MICHIGAN

DEBEVOISE-ANDERSON COMPANY, INC., Eastern Representative

NEW YORK • • • BOSTON • • • PHILADELPHIA

Machinery

SENTIMENT in the East is somewhat more optimistic than in the Middle West this week, in spite of the fact that a number of machine tool orders have originated with Middle Western organizations. Inquiry maintains the improvement which it made late in August. Progressive sales managers are beginning to bear down more heavily along sales promotion lines—which is a good sign in the machine tool business. Resumption of manufacturing operations in some cases indicates depletion of machine tool stocks. Substantial orders for antifriction bearings awarded during the past few days hold for the hope of resumption of equipment buying.

New York—Slight improvement in orders and inquiry is reported by most machine tool dealers and builders. Except for a few outstanding pending lists, including the American Locomotive Co. schedule and some tools for government shops, the gain is limited. A good share of pending volume appears to be for replacement calling for one or two tools. This inquiry, however, is well spread, covering general lines of industry with few notable exceptions, including aircraft engine, radio and railroads. The carriers have been buying tools sparingly, due largely to reduced earnings and resulting economy programs. Potential business with railroads looms large, but few hazard a hope as to when it will develop.

A few eastern builders have stepped up plant schedules slightly. Deliveries on practically all standard tools are now normal, including boring equipment which has been subject to delay at some works. Prices are steady. Announcement last week that Ford Motor Co. had placed an order for more than $250,000 with the Bullard Co., Bridgeport, Conn., was an encouraging factor. It now develops that there has been a slight flurry with other auto builders, although such business is reported to have been placed in the West.

Sentiment has improved, except in a few cases. The early Fall was expected to bring an improvement in the demand for equipment. Such appears to be the case, but the gain generally speaking has been slight. While considerable long pending business has been withdrawn from the active list, new inquiry coming in appears to be of the more active type. Export trade continues steady.

Worcester, Mass.—The general tendency of the market toward resumption of trade continues. Inquiries in most lines are more numerous, some of the railroad producing lines having come into the market even though with small orders widely placed. Grinders continue to lag, though they held strong long after the remainder of the market started dropping. Small tools are quiet.

Pittsburgh—Slightly better inquiry for machine tools is reported by dealers recently, but awards have not improved upon the poor activity of August which resulted in that month's business being the dullest of the year for most sellers. Pending work is in fair volume and purchases by the smaller users are expected to be governed to a certain degree by the future trend of business while the larger companies appear more likely to follow out projected programs. Westinghouse Electric & Mfg. Co. continues a fairly steady buyer. Jones & Laughlin Steel Corp. will buy a few tools in addition to other equipment in connection with the improvement program under way for its local plants. Railroad purchases continue dull.

Cleveland—The predicted after Labor day revival in the machine tool business has not materialized to any marked extent in the Cleveland district, although the revival of inquiry which began to be noticeable late in August is continuing. Well informed sales managers do not look for any marked improvement within the next two months, although they are giving prompt and careful attention to inquiries as insurance on future business. There are indications also of a tendency toward the release of funds for sales promotion, which in the machine tool business is apt to be an indication that better times are not far off. One concern which was practically shut down throughout the month of August, announces a September production schedule of 25 large machines—more to rebuild their back log, however, than to meet any current spurt in sales.

Manufacturers of antifriction bearings have received lately some substantial orders, and in one instance have announced an intention to resume equipment purchases on a moderate scale, which holds forth possibilities to the builders of production tools. The employment situation has improved little, if any, during the past week.

Bids go in next week on 22 tools for Wright Field, this list including a jig borer, milling machine, boring machine, shaper, and several power saws and planers.

Chicago—Prospects in the machine tool market for early autumn business are improving slowly. Not so much fresh inquiry has developed, but prospective buyers are showing interest. Several houses report growing sales volumes. One dealer's July-August sales totaled nearly the amount of the previous six months. Despite the fact that not much can be expected soon from the implement and tractor works in the West, machine tool sales offices are keyed to the expectation of general improvement. Northern Indiana Public Service Co. will buy $25,000 to $30,000 worth of shop tools, including milling machine, lathe, punch press, welding equipment and other tools.

The local steelworks which has been in the market for equipment, has added a 5-foot radial drill, 16-inch lathe and a 14-inch grinder to its inquiry. Majestic Household Utilities Corp., which has been a mainstay in the machine tool market for several months, is making further scattered purchases, including swadging equipment. Chicago board of education has purchased several drills for the new Austin high school, but is re-advertising for the 18 lathes that have been on inquiry. The board also is inquiring for sheet metal equipment for several other schools. Orton Crane & Shovel Co. reports that its standard line of heavy machinery has shown a volume for the first six months of this year about 22 per cent ahead of the similar 1929 period.

Completes New Laboratory for Alloy Research

Firth-Sterling Steel Co., McKeesport, Pa., opened a new research laboratory Sept. 8, this laboratory to be used for the increased production of Firthite, a high-speed alloy of cobalt, carbon and tungsten. This material is used chiefly for boring, planing, turning, and milling and is said to be second only to the diamond in hardness. The new laboratory, which represents a $200,000 investment, also will be used for research work on other metals. The building is equipped with a variety of apparatus for the testing of materials as well as a miniature steel mill for experimental developments.

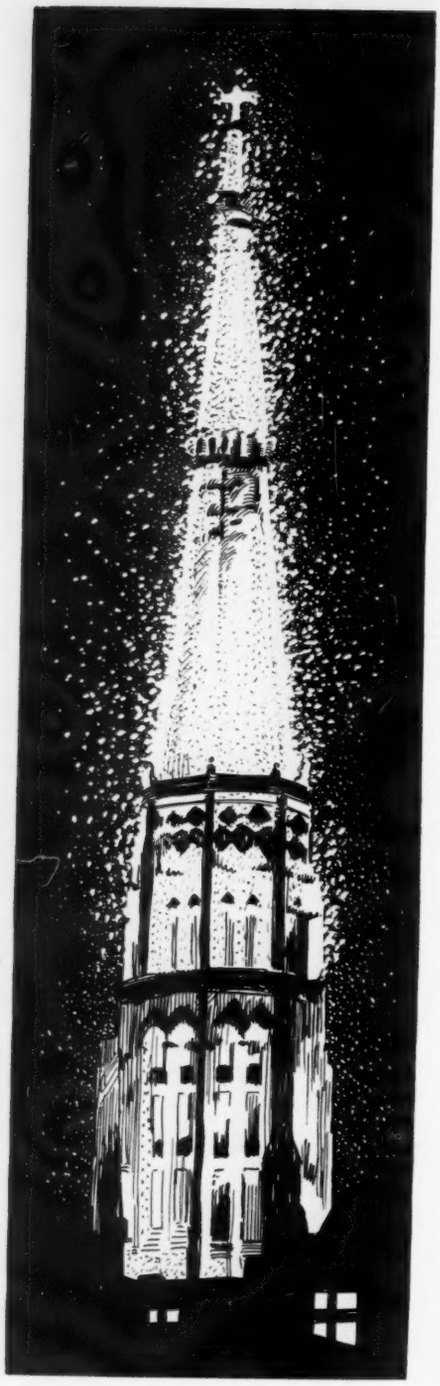
National Metal Congress and Exposition in Chicago for Third Time

Steel Treating, Metallurgical, Welding and Metalworking Organizations Arrange Technical Programs To Occupy Five Days, Sept. 22-26

Underwood & Underwood

Looking south on Michigan avenue. In the left foreground is the Tribune Tower and at the right is the Clock Tower of the Wrigley building

ONCE again steel makers, engineers, metallurgists, technicians and fabricators of metal products are preparing to convene for the Twelfth National Metal congress and exposition, the annual event which during the past several years has established itself as the most outstanding to America's ferrous and nonferrous industries. For the third time in 12 years and the second time in five years Chicago occupies the role of host to the thousands who will participate in the technical programs or attend the exhibition. Except that the sponsoring organization remains the same, the 1919 convention and exhibits held in the Seventh Regiment Armory offered little in comparison with the greatly expanded conventions and shows of 1926 and 1930. Five years ago Municipal Pier housed the exhibition, while technical programs were conducted in the Drake hotel; this year, and for the first time, the exhibition and sessions will be accommodated under one roof in the new Stevens hotel. Throughout five days beginning Sept. 22 and lasting through Sept. 26, executives and technically trained specialists of the metals world will hear the reading of more than a hundred papers, will enter into discussions and roundtable conferences and will inspect in the 175 exhibits the latest materials, equipment and processes available to industry. The National Metal congress and exposition is the outgrowth of a humble beginning made by a young organization known as the American Steel Treaters' society, which, later merging with another group, became the American Society for Steel Treating. The new society conducted its annual convention and exhibit for



Spire of the Temple building in the middle of the Loop

several succeeding years with increasing success and prestige. Four years ago the American Welding society arranged to hold its fall meeting concurrently and to make its Welding and Cutting exposition a part of the larger show. At about the same time the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers scheduled its annual meeting to be concurrent and since has continued to be one of the principal participating groups. For the Cleveland Metal congress and exposition in 1929, the Iron and Steel division of the Metallurgical Engineers, as well as the Iron and Steel division of the American Society of Mechanical Engineers, also held series of meetings with results justifying similar co-operation this year. Another group joining in the 1930 program is the Machine Shop Practice division of the Mechanical Engineers, a group which participated on one occasion several years ago. Attracted by the exposition, two other organizations are arranging meetings in Chicago during the week, but will be less intimately associated in the technical programs than the other groups. These are the International Railroad Master Blacksmiths' association and the Gas Products association.

Held Under One Roof

HOUSING of the exposition and meetings of several of the organizations under one roof offers many advantages despite the fact that limited exhibit space will necessitate some curtailment of exhibitor's displays. The Stevens hotel, the largest in the world, provides a large and attractive display area, has plenty of rooms for meetings and can house comfortably the thousands of people visiting Chicago for the occasion.

Although the Stevens hotel has a sizable exhibition hall, this space alone is insufficient for the National Metal exposition, consequently it will be necessary to utilize also the grand ball room, main dining room, lounge and foyers. All told, this provides 70,000 square feet where the 175 exhibitors connected in various ways with the manufacture, treatment or fabrication of iron, steel and nonferrous metals will display their products. The list of exhibitors appears on succeeding pages.

Headquarters for the American Society for Steel Treating, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers and Gas Products association will be at Stevens hotel. The American Welding society will maintain headquarters at the Congress hotel nearby to the Stevens and will hold its sessions there also. The Master Blacksmiths' association has chosen the Hotel Morrison for its headquarters.

THIRTY-SIX papers dealing with a wide range of subjects, including steel melting practice, forging practice, heat treating processes, heat and corrosion-resisting alloys, furnace operation, metals testing and nitriding, are scheduled for presentation before the convention of the American Society for Steel Treating. Sessions will be held morning and afternoon on each of the five days. the annual business meeting of the society will take place on Wednesday morning and will be followed by the annual Edward DeMille Campbell Memorial lecture presented this year by Dr. Marcus A. Grossmann, Republic Steel Corp., Canton, O. Dr. Grossmann's subject will be "Oxygen in Steel." So well attended and provocative of interest was last year's nitriding symposium that a similar symposium is arranged for Friday both morning and afternoon. The principal social feature of the convention will be the annual banquet in the north ballroom of the Stevens.

Incidentally, the American Society for Steel Treating is about to record its tenth birthday for on Sept. 14, 1920, the American Steel Treaters' society and the Steel Treating Research society were amalgamated into the present organization at a convention in Philadelphia. The Steel Treating Research society had been organized in Detroit in 1914 to awaken interest in the then young craft of heat treating and to disseminate knowledge of the subject. The American Steel Treaters' society was composed originally of a number of Chicago metallurgists with similar aims. By 1920 each organization had several chapters and it was felt that since purposes were identical, the science of metallurgy could be served better by a single large society.

The initiative in the amalgamation was taken by Lieut.-Col. A. E. White, professor of chemical engineering, University of Michigan, who was a member of both societies. Following a favorable vote, the two were united with a total of 1700 members. At present, ten years later, the membership exceeds 6000.

The American Welding society will maintain its headquarters at the Congress hotel and all technical sessions,

Condensed A.S.S.T. Program

Monday, Sept. 22

10:00 a.m.—6:00 p.m.—Exposition open.
10:00 a.m.—Technical session.
12:00 m.—Registration.
2:00 p.m.—Technical session.

Tuesday, Sept. 23

8:15 a.m.—Plant visitation.
10:00 a.m.—Sales conference.
12:00 m.—10:00 p.m.—Exposition open.
2:00 p.m.—Technical session.

Wednesday, Sept. 24

8:15 a.m.—Plant visitation.
10:00 a.m.—6:00 p.m.—Exposition open.
10:00 a.m.—Annual business meeting.
10:30 a.m.—Campbell Memorial lecture.
2:00 p.m.—Technical session.

Thursday, Sept. 25

8:15 a.m.—Plant visitation.
10:00 a.m.—6:00 p.m.—Exposition open.
10:00 a.m.—Technical session.
2:00 p.m.—Technical session.
6:30 p.m.—Annual banquet.

Friday, Sept. 26

8:15 a.m.—Plant visitation.
10:00 a.m.—Technical session.
12:00 m.—10:00 p.m.—Exposition open.
2:00 p.m.—Technical session.

Note: All technical sessions, business meeting and banquet are to be held in the north ballroom of the Stevens hotel.

Program of Papers for Steel Treaters

Monday, Sept. 22

MORNING

9:30 a.m.—Technical session. Chairman: H. W. Gillett.

9:45 a.m.—"Corrosion and Heat Resistant Nickel-Copper-Chromium Cast Irons," by J. S. Vanick and P. D. Merica, International Nickel Co., New York.

10:20 a.m.—"Fatigue Tests of Small Specimens with Reference to Size Effect," by R. E. Peterson, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

10:55 a.m.—"Physical Properties of Fine Bolts," by H. B. Pulsifer, Ferry Cap & Set Screw Co., Cleveland.

11:30 a.m.—"Electrolytic Decomposition of Cementite and Austenite," by H. A. Schwartz, G. M. Guiler and H. H. Johnson, National Malleable & Steel Castings Co., Cleveland.

AFTERNOON

2:00 p.m.—Technical session. Chairman: H. J. French. "Stresses and Cracks in Hardened and Ground Steel," by G. R. Brophy, General Electric Co., Schenectady, N. Y.

2:30 p.m.—"Metastable Equilibrium in Hypereutectoid Iron-Carbon Alloys," by A. A. Bates and D. E. Lawson, Case School of Applied Science, Cleveland, and H. A. Schwartz, National Malleable & Steel Castings Co., Cleveland.

3:00 p.m.—"Estimation of Internal Stress in Quenched Hollow Cylinders of Carbon Tool Steel," by O. V. Greene, Carpenter Steel Co., Reading, Pa.

3:30 p.m.—"Cold Heading Die Life," by A. S. Jameson, International Harvester Co., Chicago.

4:00 p.m.—"Effects of Prequenched Treatments on the Hardness, Body and Structure of Hardened Tool Steel," by R. H. Harrington, General Electric Co., Schenectady, N. Y.

Tuesday, Sept. 23

MORNING

8:15 a.m.—Plant visitation.

9:30 a.m.—Sales Session. Chairman: Donald G. Clark. Dramatized lecture on selling by Prof. R. C. Borden and Alvin C. Busse, New York university, New York.

AFTERNOON

2:00 p.m.—Technical session. Chairman: J. Fletcher Harper.
"Forging Practice, United States Naval Gun Factory," by S. L. Blankenship, Naval Gun Factory, Washington.

2:30 p.m.—"Heat Treatment Furnaces Used in Manufacture of Telephone Equipment," by W. A. Timm, Western Electric Co., Chicago.

3:00 p.m.—"Scaling of Steel at Forging Temperatures," by W. E. Jominy and D. W. Murphy, University of Michigan, Ann Arbor, Mich.

3:30 p.m.—"Copper Brazing in Hydrogen Electric Furnaces," by H. M. Webber, General Electric Co., Schenectady, N. Y.

Wednesday, Sept. 24

MORNING

8:15 a.m.—Plant visitation.

9:30 a.m.—Annual business meeting. Chairman: R. G. Guthrie, President.

10:30 a.m.—Campbell Memorial lecture. Chairman: Dr. Albert Sauveur.
"Oxygen in Steel," by Dr. Marcus A. Grossmann, Republic Steel Corp., Canton, O.

AFTERNOON

2:00 p.m.—Technical session. Chairman: Dr. George B. Waterhouse.
"Critical Ranges in Pure Iron-Carbon Alloys," by R. H. Harrington, General Electric Co., Schenectady, N. Y., and W. P. Wood, University of Michigan, Ann Arbor, Mich.

2:30 p.m.—"Tungsten-Carbon System," by W. P. Sykes, Cleveland Wire division, General Electric Co., Cleveland.

3:00 p.m.—"Relationship Between Welded-on Overlays and Heat Treatment," by Miles C. Smith, Stoody Co., Whittier, Calif.

3:30 p.m.—"Concentrated Pressure and Its Applications to the Rolling Process," by Dr. A. Nadai, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

4:00 p.m.—"Radiography by the Use of Gamma Rays," by R. F. Mehl and C. S. Barrett, Naval Research Laboratory, Washington, and G. E. Doan, Lehigh university, Bethlehem, Pa.

Thursday, Sept. 25

MORNING

8:15 a.m.—Plant visitation.

9:30 a.m.—Technical session. Chairman: Jerome Strauss. "Influence of Nickel on the Chromium-Iron-Carbon Constitutional Diagram," by V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh, and M. A. Grossmann, Republic Steel Corp., Canton, O.

10:10 a.m.—"Study of a High-Chromium, Low-Carbon Steel," by Arthur Phillips, Yale university, New Haven, Conn., and R. W. Baker, Republic Steel Corp., Canton, O.

10:45 a.m.—"Corrosion Test for Research and Inspection of Alloys," by W. R. Huey, E. I. DuPont de Nemours & Co., Wilmington, Del.

11:20 a.m.—"Nature of the Nickel-Chromium Stainless Steels," by Edgar C. Bain and Robert H. Aborn, United States Steel Corp., Kearny, N. J.

AFTERNOON

2:00 p.m.—Technical session. Chairman: Dr. C. H. Herty Jr.
"Process Reliability in Steelmaking," by George A. Dornin, Gathmann Engineering Co., Baltimore.

2:40 p.m.—"Tensile Properties of Carbon Steel Castings," by J. V. McCrae and R. L. Dowdell, bureau of standards, Washington.

3:15 p.m.—"Steel Ingots," by H. H. Ashdown, consulting metallurgist, Irvine, Pa.

3:50 p.m.—"Casting Guns by the Centrifugal Process," by Col. Tracy C. Dickson, Watertown Arsenal, Watertown, Mass.

Friday, Sept. 26

MORNING

8:15 a.m.—Plant visitation.

9:30 a.m.—Technical session. Chairman: V. O. Homerberg.
"Nitriding in Packing Materials and Ammonia," by A. B. Kinzel and J. J. Egan, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

10:00 a.m.—"Further Investigations in Nitriding," by Robert Sergeson and H. J. Deal, Republic Steel Corp., Massillon, O.

10:30 a.m.—"Nitriding the Larger Forgings," by J. H. Higgins, Camden Forge Co., Camden, N. J.

11:00 a.m.—"Nitriding Furnaces and Their Equipment," by W. J. Merten, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

11:30 a.m.—"Microcharacter Hardness Tester," by C. H. Bierbaum, Lumen Bearing Co., Buffalo.

AFTERNOON

2:00 p.m.—Technical session. Chairman: Edgar C. Bain. "Relation of Structure to Surface Hardness of a Case Hardened Steel," by H. W. McQuaid and O. W. McMullan, Timken-Detroit Axle Co., Detroit.

2:30 p.m.—"Recent Developments in Gas Carburization," by O. J. Wilbor and J. A. Comstock, Peoples Gas Light & Coke Co., Chicago.

3:00 p.m.—"Modifying Action of Ferrosilicon Upon the Process of Carburization," by E. G. Mahin and F. J. Mootz, Notre Dame university, Notre Dame, Ind.

3:30 p.m.—"Cemented Tungsten Carbide," by Gregory J. Comstock, Firth-Sterling Steel Co., McKeesport, Pa.

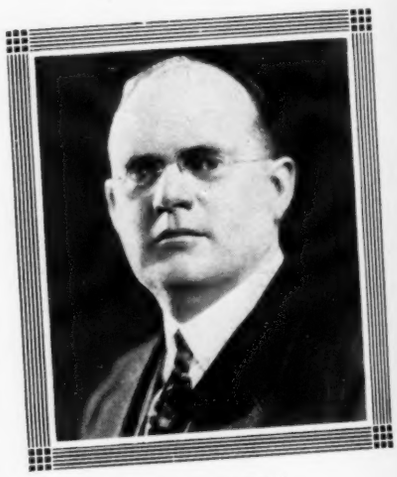
4:00 p.m.—"Resistance of Steels to Abrasion by Sand," by Samuel J. Rosenberg, bureau of standards, Washington.

Officials of Societies Prominent in

W. H. EISENMAN
Secretary, American Society for Steel Treating

C. A. ADAMS
Director, American Bureau of Welding

C. A. McCUNE
Treasurer, American Welding Society

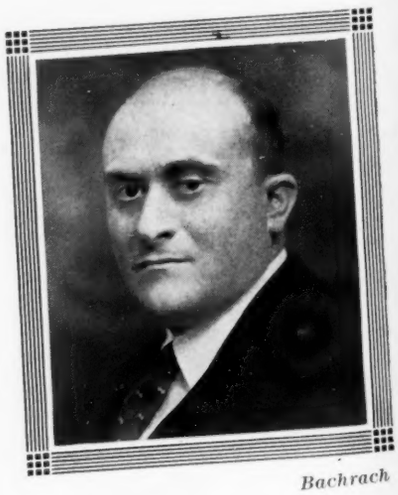


W. M. CORSE
Secretary, Institute of Metals

Blank & Stoller

E. A. DOYLE
President, American Welding Society

J. M. WATSON
Vice President, American Society for Steel Treating



Bachrach

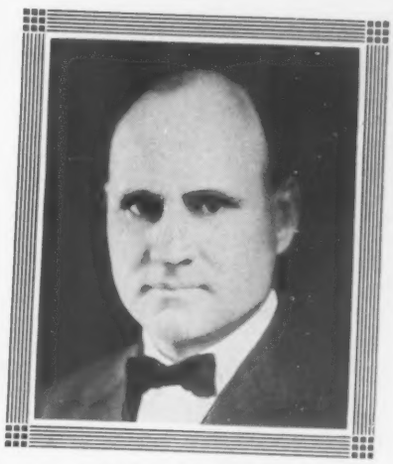
WILLIAM SPRAGEN
Technical Secretary, American Welding Society

Events of National Metal Congress

R. G. GUTHRIE
President, American Society for Steel Treating

Bachrach

A. O. FULTON
Treasurer, American Society for Steel Treating



ZAY JEFFRIES
Chairman, Institute of Metals

M. A. GROSSMANN
Campbell Memorial Lecturer, American Society for Steel Treating

Blank & Stoller

W. W. MACON
Chairman, Iron and Steel Division, American Society of Mechanical Engineers

Underwood

W. J. MACKENZIE
Chairman, Iron and Steel Division, American Institute of Mining and Metallurgical Engineers

W. J. PEETS
Chairman, Machine Shop Practice Division, American Society of Mechanical Engineers

committee meetings and social events will be held there. Technical sessions are arranged for Tuesday, Wednesday, and Friday mornings and Tuesday, Wednesday and Thursday afternoons. On Monday afternoon the structural steel welding committee will convene and will be followed by a meeting of the American Bureau of Welding, the research division of the society. The board of directors will attend a dinner meeting in the evening.

Formal business of the society will be conducted at a session on Tuesday morning preceding the technical session. The Wednesday afternoon session will take the form of a symposium on testing of welds. All of Thursday morning will be spent in an inspection of the Hawthorne Works of the Western Electric Co. The annual banquet will be served in the ballroom of the Congress hotel at 6:30 on Thursday evening and will be followed with dancing.

The complete program of the Welding society appears on Page 156.

Opens with Technical Session

EVENTS for the Iron and Steel division of the American Institute of Mining and Metallurgical Engineers will start with a session on Monday morning in Hotel Stevens. A second session will be held during the afternoon. Two joint sessions are scheduled for Tuesday, the one in the morning with the American Society for Steel Treating to hear the demonstration on salesmanship and the one in the afternoon with the Institute of Metals division of the Metallurgical Engineers. Both the Iron and Steel and Institute of Metals divisions will participate in a joint dinner in the Stevens at 6:30 on Tuesday evening. The concluding technical session will be held on Thursday morning. The program for the division will be found on Page 159.

The Institute of Metals division of the American Institute of Mining and Metallurgical Engineers opens its program by attending the salesmanship session of the American Society for Steel Treating on Tuesday morning. In the afternoon it will convene jointly with Iron and Steel division and will join with the same division for the dinner at 6:30 that evening. Technical sessions will be held on Wednesday and Thursday afternoons, while the time will be occupied on Thursday morning with a visit to the International Lead Refining Co., East Chicago, Ind. The complete program for the institute of metals is to be found on Page 157.

Arranges Joint Program

Although the Iron and Steel and Machine Shop Practice divisions of the American Society of Mechanical Engineers are separate and distinct professional units, the society is arranging only one program. Of the 18 technical papers scheduled for presentation, part are of interest to one division and part to the other, thus by grouping them properly into sessions, each division is accommodated and the activity is extended throughout the week. Headquarters are to be at the Stevens hotel and sessions are to be conducted on Tuesday afternoon and evening, and both morning and afternoon on Wednesday, Thursday and Friday. The Tuesday sessions are intended to interest the machine tool division, the session on Wednesday will appeal to a portion of each and the succeeding sessions will attract only the iron and steel division members. The two divisions will attend a joint dinner Wednesday evening. The list of papers, names of authors and arrangement of the program will be found on Page 162.

The International Railroad Master Blacksmiths' association meeting in its thirty-fourth convention at the Morrison hotel, Sept. 23-25, will hold both technical and business sessions. Technical sessions will include papers on autogenous welding, heat treatment of carbon and high-speed steel, drop and machine forging, tools and formers, spring making and repairing, reclamation and safety.

Eighteen industrial plants in the Chicago district will be open for visitation to members and guests of all societies visiting the National Metal congress and exposition. These plants include steel mills, brass foundries, lead refineries, forge shops and others manufacturing and fabricating metals. Transportation will be provided for those registering.

Ladies Will Be Entertained

TWO luncheons, a style show and several other attractive entertainments are being planned for the ladies who will be in Chicago for the congress and exposition. On Monday, Sept. 22, the ladies will be guests at a luncheon at the Stevens hotel.

Tuesday brings an automobile tour of Chicago, affording 45 miles of the most interesting views which the city can offer—its parks, residential sections, the Loop, Wacker drive and so forth. A bridge party at the Stevens is Wednesday's feature. Those who do not prefer bridge will be invited to visit the Chicago Art Gallery.

The style show comes on Thursday, the plan calling for luncheon in the dining room of Marshall Field & Co. Following this the company's most distinguished mannequins will show the latest modes.

Field Museum of Natural History in Grant Park adjacent to Soldier Field Stadium is world renowned for its collection

View toward the north on Michigan avenue showing in the left foreground the new Stevens hotel, headquarters for the Twelfth National Metal congress and exposition

Alvina Lenke Studio

175 Manufacturers Will Show Products in Annual Metal Exposition

WITH the National Metal exposition to be accommodated in the Stevens hotel, the National Metal congress and show will be housed under one roof for the first time. This arrangement should prove distinctly advantageous to both exhibitors and visitors for the easy access of displays will encourage repetitive inspections. The majority of out-of-town visitors will occupy rooms in the Stevens.

The Stevens hotel affords a large exhibition hall, but because of the size of the Metals exposition this alone is insufficient, therefore arrangements are being made to utilize the grand ballroom, main dining room, lounge and foyers as well. This provides a total of 70,000 square feet of floor space, nevertheless it will be necessary for exhibitors to display their equipment more compactly.

Some 175 companies connected in various ways with the manufacture, treatment, or fabrication of iron, steel and nonferrous metals will display their products. As usual, much of the equipment will be in operation as facilities include gas, electricity, air, water and sewer connections. A number of the exhibitors will present and demonstrate new products and processes for the first time.

Important divisions of the show will include steels and steel products, nonferrous metals, heat treating furnaces, heat treating materials, cleaning compounds, heat control apparatus and numerous metallurgical and physical testing devices. One section will be reserved for furnaces and appliances operating on gas fuel, another will group those heated with electricity. Another section has been set aside for the welding and cutting equipment, including gas and electric welding machines, cutting torches, welding electrodes and wire, accessory apparatus and a wide range of welded products.

Listed alphabetically on the following pages are to be found the names of exhibitors, brief descriptions of the exhibits and the names of company representatives:

Exposition Hours

Monday, Sept. 22—10:00 *a. m. to* 6:00 *p. m.*
Tuesday, Sept. 23—12:00 *noon to* 10:00 *p. m.*
Wednesday, Sept. 24—10:00 *a. m. to* 6:00 *p. m.*
Thursday, Sept. 25—10:00 *a. m. to* 6:00 *p. m.*
Friday, Sept. 26—12:00 *noon to* 10:00 *p. m.*

A

AIR REDUCTION SALES CO., New York. Booth 95.

AJAX ELECTROTHERMIC CORP., Trenton, N. J. Booth 5-D. Exhibiting: A 1000-pound coreless high-frequency induction furnace and photographs of furnace installations and auxiliary equipment. Representatives: G. H. Clamer, E. F. Northrup, Dudley

Wilcox, R. N. Blakeslee, A. D. Meyer and G. F. Applegate.

ALLEGHENY STEEL CO., Brackenridge, Pa. Booth 9-D. Exhibiting: Chrome-nickel, heat corrosion and acid resisting steel in various stages of manufacture and processing. Representatives: O. M. Otte, L. W. Hostettler, C. W. Green, Russel Allen and P. B. Van Horne.

EDGAR ALLEN STEEL CO., New York. Booth 5-D. Exhibiting: High-speed steels; turning and finishing steels; air-hardening steel; self-hardening steel; special chisel steel; tack knife steel; die casting steel; solid and hollow production steels; and tool steels. Representatives; Henry Sears Hoyt, V. A. Greene, E. R. Carnell, H. R. Adams and R. M. Brushingham.

ALLIED OIL CO., Cleveland, Booth 10-F. Exhibiting: A working display of pickling acid and commercial sulphuric acid in which samples of various steels will be pickled for different lengths of time; also samples of S. A. E. grades of steel and other materials. Representatives: W. B. Stevenson, E. G. Richardson, J. L. Manneville, C. C. Crane, D. P. Summers and E. P. Kastien.

ALUMINUM CO. OF AMERICA, Pittsburgh. Occupying booth 5-L.

AMERICAN BRASS CO., Waterbury, Conn. Booth 92. Exhibiting: Nonferrous welding rods; samples of cast iron welded with tobin bronze; a copper-rich alloy containing manganese and silicon; proper welding methods using tobin bronze filler rods and oxyacetylene process. Representatives; W. H. Dowd, A. M Dinkler, W. C. Swift, A. L. O'Brien, C. D. Pillsbury, I. C. Ralph, J. P. Hocking, F. W. Hackett, F. E. Hill and H. G. Wallis.

AMERICAN CAR & FOUNDRY CO., New York. Booth 51. Exhibit-

Welding Society Program Diversified

FOR the fourth consecutive year the American Welding society has arranged its fall meeting coincident with the activities of National Metal week and the National Metal congress. This year, as before, a section of the National Metal exposition at Stevens hotel has been set aside for manufacturers' displays featuring welding and cutting equipment and accessories, together with products fabricated by gas or electric welding methods.

Headquarters for the society will be maintained at the Congress hotel and all technical sessions and committee meetings will convene there. The technical program this year starts Tuesday morning at 10:00 a. m. and continues morning and afternoon thereafter through Friday morning. Registration, however, will be commenced Monday morning. Three events will take place Monday afternoon and evening; a meeting of the structural welding committee; a meeting of the American Bureau of Welding; and a dinner meeting of the board of directors of the society. A short business session will be held Tuesday morning, in charge of President E. A. Doyle.

Welding society members are welcome to participate in plant inspection trips arranged by the American Society for Steel Treating and a list of plants included in this schedule is presented on another page. A special trip, however, has been arranged for society members, to the Hawthorne works of the Western Electric Co.

The annual banquet and dance will be held Thursday evening in the Gold ballroom of the Congress hotel. Following is the detailed program arranged for the American Welding society:

Monday, Sept. 22

MORNING

10:00 a.m.—Registration.

AFTERNOON

2:00 p.m.—Meeting of structural steel welding committee.

3:45 p.m.—Meeting of the American Bureau of Welding. Chairman: C. A. Adams, director.

EVENING

6:00 p.m.—Dinner meeting of the board of directors. Chairman: E. A. Doyle, president.

Tuesday, Sept. 23

MORNING

10:00 a.m.—Business session. Chairman: E. A. Doyle, president.
Address of welcome by Richard M. Wolf, commissioner of public works, Chicago.
Response by C. A. McCune, general chairman of fall meeting and exposition.

10:30 a.m.—Technical session. Chairman: J. J. Crowe.
"Welding of Stainless Steel," by L. W. Hostettler, Allegheny Steel Co., Brackenridge, Pa.
"Arc Welding of Aluminum," by W. M. Dunlap, Aluminum Co. of America, New Kensington, Pa.
"Oxyacetylene Welding of Corrosion-Resisting Steels," by W. B. Miller, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

AFTERNOON

2:00 p.m.—Technical session. Chairman: F. T. Llewellyn, past president.
"The Examination of Welds by the X-Ray Diffraction Method," by J. T. Norton, Massachusetts Institute of Technology, Cambridge, Mass.
"Fatigue Investigations of Welded Joints," by G. E. Thornton, State College of Washington, Pullman, Wash.
"Stress Distribution in Side-Welded Joints," by Walter H. Weiskopf, consulting engineer, New York, and Milton Male, United States Steel Corp., New York.

Wednesday, Sept. 24

MORNING

10:00 a.m.—Technical session. Chairman: E. A. Doyle.
"Resistance Welding of Bar Joists," by Frank Burton, Steel Joist institute, Detroit.
"Cost of Using Welding," by Robert E. Kinkead, consulting engineer, Cleveland.
"Strength of Welded Joints in Tubular Members for Aircraft," by H. L. Whittemore, bureau of standards, Washington.

AFTERNOON

2:00 p.m.—Symposium on testing of welds. Chairman: H. L. Whittemore.
Introduction and suggested revision of the American Bureau of Welding bulletin No. 1 by the American Bureau of Welding committee on standard tests for welds.
"Tensile Tests for Welds," by J. W. Owens, Welding Engineering & Research Corp., New York.
"Bend Tests for Welds," by W. B. Miller, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.
"Shear Tests for Welds," by Andrew Vogel, General Electric Co., Schenectady, N. Y.
"Fatigue and Impact Tests for Welds," by C. H. Jennings, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
"Use of Gamma Rays for Testing Welds," by R. F. Mehl and C. S. Barrett, Naval Research Laboratory, Washington, and G. E. Doan, Lehigh university, Bethlehem, Pa.

Thursday, Sept. 25

MORNING

9:30 a.m.—Inspection trip to Hawthorne works of Western Electric Co.

AFTERNOON

2:00 p.m.—Technical session. Chairman: F. P. McKibben.
"Application of Fusion Welding to Pressure Vessels," by J. C. Hodge, Babcock & Wilcox Co., Barberton, O.
"Physical Properties of Electrically Welded Tubing," by J. S. Adelson, Steel & Tubes Inc., Cleveland, E. O. Sequist and H. L. Whittemore, bureau of standards, Washington.
"Magnetic Testing of Butt Welds," by T. R. Watts, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

EVENING

6:30 p.m.—Annual banquet and dance.

Friday, Sept. 26

MORNING

10:00 a.m.—Railroad session. Chairman: E. Wanamaker.
"Double Lengthening Railroad Rails," by L. C. Ryan, Oxweld Railroad Service Co., Chicago.
"The Possibilities of Further Development of Railroad Welding," by G. W. Lieber, Missouri-Kansas-Texas Railroad Co., Parsons, Kans.
"Reclamation of Battered and Worn Ends of Railroad Track," by C. J. Bergunthal, Southern Pacific Co., San Francisco, Calif.
"Elimination of Joint in Open Track," by J. H. Deppeler, Metal & Thermit Corp., New York.

ing: Electric rivet heater; electric forging heater for heating stock for forging and upsetting. Representatives: F. C. Cheston, A. G. Wood and Harold Cheston.

AMERICAN CYANAMID CO., New York. Booth 19-B. Exhibiting samples of cyaniding materials and literature. Representatives: G. N. Omohundro, H. H. Suddard, G. B. Horsfull, H. M. Sunderland, George D. Johnson, P. E. Holder and E. L. Knapp.

AMERICAN FORGE CO., Chicago. Booth 7-F. Exhibiting: Upset forgings. Representatives: W. E. Corcombe, F. Gauch, F. L. Moore, A. Nettenstrom, H. Mulford, S. E. Burns and L. W. Eighmy.

AMERICAN GAS ASSOCIATION, New York. Booths 50, 52 and 62.

AMERICAN GAS FURNACE CO., Elizabeth, N. J. Booth in Gas Section. Exhibiting: Reciprocating-hearth continuous heating machine; oven furnace with nickel-chrome hearth; rotary retort carburizing machine; rotary retort melting machine; insulated toolroom oven furnace; and other small equipment and appliances. Representatives: P. C. Osterman, E. C. Cook, John Meheman, T. Farwick Sr., W. J. Barenscheer, G. Schwab, O. T. Muehlemeyer, S. C. Dinsmore and W. K. Kelsey.

AMERICAN STEEL & WIRE CO., Chicago. Booth 71. Exhibiting: Welding wire and rods; cold-drawn and cold-rolled strip steel for stamping and manufacturing purposes; springs from watch to locomotive size; wires and rods in round, flat, square, oval, star and other odd shapes. Representatives: F. Connell, W. E. Mackley, G. S. Rose, E. S. Humphrys, C. J. McGregor, H. B. Maguire, A. E. Ward, P. M. Jones, W. L. Blazier, R. C. Fisher, L. S. Young, W. H. Cordes, E. E. Louis and R. Francisco.

ANCHOR DRAWN STEEL CO., Latrobe, Pa. Booth 24-B. Exhibiting: Fractures, samples, shapes and sections of stainless irons and steels, nitriding steels, copper-clad irons and steels, high-speed, carbon and alloy-tool steels. Representatives: R. C. McKenna, Floyd Rose, L. D. Bowman and J. P. Gill.

ARMSTRONG-BLUM MFG. CO., Chicago. Booth 29. Exhibiting: New model full ball-bearing high-speed hacksaw doing full automatic production cutoff work; metal handsaw in universal application to a wide variety of sawing work in bars, structural shapes, pipe, etc.; breakdown test on high-speed edge power hacksaw blades. Representatives: Harry J. Blum, Stanley A. Woleben and Gustav M. Hess.

ARMSTRONG BROS. TOOL CO., Chicago. Booth 27. Exhibiting: Lathe, planer and shaper tools; lathe dogs; C clamps; ratchet drills; drop forged wrenches; and pipe tools. Representatives: Horace Armstrong, W. T. Armstrong and George Nufer.

ARMSTRONG CORK & INSULATION CO., Lancaster, Pa. Booth 6-L. Exhibiting: Insulating brick; cork

Institute of Metals Plans Active Week

THREE comprehensive technical sessions feature the program of the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers which is again participating prominently in the National Metal congress. Headquarters and all technical sessions will be at the Stevens hotel. A joint session with the Iron and Steel division of the same society will be held Tuesday afternoon, with theoretical metallurgy the general subject. A second session, general in nature, is scheduled for Wednesday afternoon; and a third on Thursday afternoon at which seven papers dealing with aluminum and aluminum alloys will be read. A special inspection trip to nonferrous metal plants has been arranged for Thursday morning for members of the institute while on Wednesday morning delegates will be free to attend the Campbell Memorial lecture sponsored by the American Society for Steel Treating. The Institute of Metals and Iron and Steel divisions will attend a joint dinner Tuesday evening at Stevens hotel. The dinner will be informal and ladies are invited to attend. Dr. B. D. Saklatwalla, vice president, Vanadium Corp. of America, Bridgeville, Pa., will present a nontechnical address on vanadium. Following is the complete program of events for the Institute of Metals:

Tuesday, Sept. 23

AFTERNOON

2:00 p.m.—Joint Session on Theoretical Metallurgy with Iron and Steel division. Chairman: S. L. Hoyt.

"Studies upon the Widmanstatten. I. Introduction. The Aluminum-Silver System and the Copper-Silicon System, by Robert F. Mehl, superintendent, and Charles S. Barrett, assistant physicist, division of physical metallurgy, Naval Research laboratory, Washington.

"Cemented Tungsten Carbide. A Study of the Action of the Cementing Material," by L. L. Wyman and F. C. Kelley, metallurgists, research laboratory, General Electric Co., Schenectady, N. Y.

"Transformation of Austenite at Constant Subcritical Temperatures," by E. S. Davenport and E. C. Bain, research laboratory, United States Steel Corp., Kearny, N. J.

EVENING

6:30 p.m.—Joint Dinner with the Iron and Steel division.

Address: "Vanadium," by Dr. B. D. Saklatwalla, vice president, Vanadium Corp. of America, Bridgeville, Pa.

Wednesday, Sept. 24

AFTERNOON

2:00 p.m.—General Technical session. Chairman: W. R. Webster.

"Influence of Casting Practice on the Physical Properties of Die Castings," by Charles Pack, consulting engineer, New York.

"Effect of Certain Alloying Elements on Structure and Hardness of Aluminum Bronze," by Selma F. Hermann, metallurgical laboratory, Wright field, Dayton, O., and Frank T. Sisco, editor, *Alloys of Iron Research*, Engineering Foundation, New York.

"Thermal Conductivity of Copper Alloys. Part II—Copper-Tin Alloys. Part III—Copper-Phosphorus Alloys," by Cyril Stanley Smith, research metallurgist, American Brass Co., Waterbury, Conn.

"Application of X-Rays to Development Problems Connected with the Manufacture of Telephone Apparatus," by M. Baeyertz, metallurgical development department, Western Electric Co., Chicago.

Thursday, Sept. 25

MORNING

8:00 a.m.—Nonferrous Metal Plant Visitations.

AFTERNOON

2:00 p.m.—Aluminum session. Chairman: H. W. Gillett.

"Constituents of Aluminum-Iron-Silicon Alloys," by William L. Fink and Kent R. Van Horn, both of the metallurgical division, research laboratories, Aluminum Co. of America, Cleveland.

"Aluminum - Silicon - Magnesium Casting Alloys," by R. S. Archer and L. W. Kempf, both of the metallurgical division, research laboratories, Aluminum Co. of America, Cleveland.

"Equilibrium Relations in Aluminum-Antimony Alloys of High Purity," by E. H. Dix Jr., metallurgist, F. Keller, assistant metallurgist, and L. A. Willey, assistant metallurgist, research laboratories, Aluminum Co. of America, New Kensington, Pa.

"Equilibrium Relations in Aluminum-Magnesium Silicide Alloys of High Purity," by E. H. Dix Jr., metallurgist, F. Keller, assistant metallurgist, and R. W. Graham, assistant metallurgist, research laboratories, Aluminum Co. of America, New Kensington, Pa.

"Modulus of Elasticity of Aluminum Alloys," by R. L. Templin and D. A. Paul, both of the Aluminum Co. of America, New Kensington, Pa.

"Quenching of Alclad Sheets in Oil," by H. C. Knerr, president, Metallurgical Laboratories Inc., Philadelphia.

"Experiments on Retarding the Age-Hardening of Duralumin," by E. H. Dix Jr., metallurgist, and F. Keller, assistant metallurgist, research laboratories, Aluminum Co. of America, New Kensington, Pa.

covering; corkboard roof insulation; and high-pressure covering. Representatives: Paul Taichinger, S. M. Jenkins and L. W. Bertelsen.

ASSOCIATED ALLOY STEEL CO., Cleveland. Booth 3-D. Exhibiting: Corrosion, heat and acid-resisting steel of the 18 per cent chromium and 8 per cent nickel composition; and nitriding steels. Representatives: D. B. Carson, H. A. DeFries, C. B. Boyne, K. G. Reynolds, W. L. Wiewel, P. E. Floyd, W. Kinsey, A. N. Vogt, J. E. Polhemus, R. P. McCarty, P. L. Coddington, G. F. Wilson and W. L. Weaver.

AUTOMATIC TEMPERATURE CONTROL CO., Inc., Philadelphia. Booth 27-D. Exhibiting: Valves, motor-operated controllers; relays; time-cycle contractors; motor-operated interrupters; electric heat controller; and contact instruments of various makes. Representatives: C. Wilhjelm, J. D. Andrews, O. W. Stowe; I. G. Johanson, R. A. Smart and G. S. Frazee.

B

BABCOCK & WILCOX CO. and BABCOCK & WILCOX TUBE CO., New York. Booth 32-B. Exhibiting: Welded pressure vessels which have withstood more than 2,000,000 pressure tests; specimens of welds in carbon steel and stainless alloy steels made by new welding technique; chrome-nickel alloy steel process equipment showing welded construction; heat exchangers of stainless steel; castings made from chromium alloy steels; oil still headers cast from chrome-nickel steel; cast alloys for high temperature service; and stainless steel tubing. Representatives: W. W. Eaton, J. Brett, A. G. Reilly, A. R. McAllister, J. C. Hodge, S. J. Crooker, W. E. Sparrow Jr., R. L. Ripley, H. D. Newell, N. Hamilton, Magnus Christensen and W. M. Glen.

BASTIAN-BLESSING CO., Chicago. Booth 96. Exhibiting: Welding and cutting torches, regulators, welding torches and cutting torches. Representatives: E. L. Mills, L. C. Roney, E. N. Stevens, H. A. Goodwin, J. T. Kinney, G. W. Irwin, T. H. Kennedy, C. H. Sandberg, F. C. Lane, M. J. LaDue, T. Norden and E. M. Evleth.

BAUSCH & LOMB OPTICAL CO., Rochester, N. Y. Booth 34-B. Exhibiting: Microscopes for the metallurgical industry; photomicrographic apparatus; colorimeters, tool makers' microscopes; metallographic equipment; magnifiers; reading glasses and other optical instruments. Representatives: I. L. Nixon, H. L. Shippy, W. Patterson and M. Stevens.

BELL & GOSSETT CO., Chicago. Booth 46-B. Exhibiting: Carburizing compounds, cyanide mixture, drawing salts, case hardener, furnace cements, scleroscope, hardness testers, pressed steel pots, sheet alloy containers, cast-alloy containers, furnaces, quenching oil coolers and tanks, liquidometers, water heaters and quenching oils. Representatives: W. C. Bell, E. J. Gossett, J. S. Ayling, W. Ellis, W. P. Gossett and C. C. Becker

BETHLEHEM STEEL CO., Bethlehem, Pa. Booth 30-B. Exhibiting: Structural steel; alloy steels including spring steel; corrosion-resisting steels including a new free-machining steel; and high-speed tool steels. Representatives: G. F. Hocker, R. S. Tucker, D. C. Roscoe, T. J. Fitzgibbons, F. H. Baldwin, J. E. McKinney, W. R. Shimer, T. G. Foulkes, J. P. Witteman, A. P. Spooner, J. H. Stoll, H. R. Weeman, H. W. Hibshman, W. E. Titus, H. E. Graffin, G. Cushman, J. W. Codding, F. E. Fisher, R. MacDonald and J. F. Gaffney.

BOTFIELD REFRACTORIES Co., Philadelphia. Booth 45. Exhibiting: Refractories, cements and mixtures with specimens bonded and surfaced with these materials. Representatives: Axel H. Engstrom and W. B. Smith.

BRISTOL CO., Waterbury, Conn. Booth 27-B. Exhibiting: Pyrometers and thermometers, recording and controlling equipment for furnaces, oil baths, enameling ovens, core ovens, etc; and set and cap screws. Representatives: H. L. Griggs, L. G. Bean, H. W. Moss, J. L. Williams, R. M. Walker, G. H. Gaites, C. W. Williamson, W. F. Emery, C. Worth, H. Will and A. O. Garver.

BROWN INSTRUMENT CO., Philadelphia. Booth 21-B. Exhibiting: Instruments for measuring and controlling furnace temperatures and other operating factors in metalworking; automatic control pyrometer equipment, an indicator and trend-analyzing recorder, flow meters, tachometers and carbon dioxide meters. Representatives: G. W. Keller, C. L. Saunders, J. C. Vaaler, W. L. Gustafson, M. F. Jacobs, N. I. Cockley and I. K. Farley.

C

CALORIZING CO., Wilkinsburg, Pa. Booth 12-Ba.

ANDREW C. CAMPBELL INC., Waterbury, Conn. Booth 25. Exhibiting: A nibbling machine; two display boards showing parts and articles nibbled and photographs of several models in which the machine is made. Representatives H. R. Powell.

CARBOLOY CO. INC., Detroit. Booth 10. Exhibiting: Turret lathe tooled up with tungsten carbide tools; typical tungsten carbide tools; specimens of materials machined with tungsten carbide; wire drawing dies; and specimens of drawn materials. Representatives: W. W. Fullagar, P. O. Deeds, N. N. Shepherd, G. M. Moote, E. V. Johnson, F. R. Johnson, P. J. Conner, W. S. Baker, E. C. Howell and V. L. Allen.

CARBORUNDUM CO., Niagara Falls, N. Y. Booth 53. Exhibiting: Grinding wheels for all purposes, snagging wheels, wheels for grinding tungsten carbide, grains of polishing material and polishing cloth. Representatives: S. F. Courter, B. N. Work, F. E. Gridley, R. C. Bradbury, R. Rannie C. E. Hawke, R. A. Beverley and S. A. Fenno.

CARBORUNDUM CO., Perth Amboy, N. J. Booth 53. Exhibiting: Completely assembled section of a recuperator and by means of fans will demonstrate the unit; refractory brick, tile and special shapes, including hearths and muffles for heat treating furnaces; samples of high-temperature cements. Representatives: R. A. Beverley, S. A. Fenno, J. A. King, R. S. Baker, R. J. Penny and W. C. Thiess.

CARPENTER STEEL CO., Reading, Pa. Booth 6-B. Exhibiting: Stainless and corrosion-resisting steels; products made from these materials; demonstration of hot acid etch inspection of tool steels. Representatives: F. A. Bigelow, J. H. Parker, R. V. Mann, F. R. Palmer, B. H. DeLong, G. V. Luerssen, P. H. Greenawald, O. V. Greene, G. H. Edmonds, W. M. Loos, R. L. Williams, H. J. Joyce, J. B. Guthrie, K. L. Crickman, E. Von Hambach, L. E. Cooney, R. I. Beeson, C. W. Windfelder, E. E. Mueller, J. L. Hall and Leroy Owen.

CASE HARDENING SERVICE CO., Cleveland. Booth 46-B. Exhibiting: Hardening room materials and equipment including carburizing and cyanide compounds, cyanide, drawing salts, hardening salts, lead pot covering, anticarburizing paint, pressed and heat-resisting steel pots and boxes, and oil coolers. Representatives: W. C. Bell, E. J. Gossett, J. S. Ayling and C. P. Critizer.

CHICAGO STEEL FOUNDRY CO., Chicago. Booth 41. Exhibiting: Steel castings for heat-resisting applications; and steel castings for high-strength and abrasion-resisting applications. Representatives: David Evans, B. G. Tarkington, C. McA. Evans, J. A. Marr, Joe Frank, G. MacMillan and A. I. Gilbert.

CHICAGO STEEL & WIRE CO., Chicago. Booth 106.

CLIMAX MOLYBDENUM CO., New York. Booth 23-D. Exhibiting: Molybdenum in various forms as used in the iron and steel, chemical and die industries. Representatives: H. L. Brown, J. B. Thorpe, A. Kissock, W. P. Woodside, George O. Loeffler, E. R. Young and J. Kent Smith.

COLONIAL STEEL CO., Pittsburgh. Booth 24-B. Exhibiting: Fractures and samples of high-speed, carbon and alloy tool steels and ply steels; samples of mining drill and copperclass steels; samples and fractures of stainless irons, stainless steels and nitriding steels. Representatives: R. C. McKenna, J. P. Gill, F. Rose, L. Woods, N. B. Hoffman, T H. Nimick, H. M. Bray and I. N. King.

COLUMBIA TOOL STEEL CO., Chicago Heights, Ill. Booth 23-B. Exhibiting: High-speed steels; high-carbon high-chromium steel; nonshrinking steel; alloy steels; carbon tool steel in bar form; ingots, alloy and fractures; tools and articles made with tool steel. Representatives: A. T. Clarage, R. M. Sandberg, C. B. Shoenberger, W. J. Mathews, A. J. Scheid Jr., T. G. Dougall, A. J. Scheid, A. W. Mierow, C. F. Scheid, W. M. Hopkins, T. L. Haines, L. Elsman and S. F. Evans.

CORHART REFRACTORIES CO. INC., Louisville, Ky. Booth 6-F. Exhibiting: Refractory shapes with simple demonstrations of the properties of the materials. Representatives: Fred W. Schroeder, H. W. Baque and Fred S. Thompson.

CRUCIBLE STEEL CO. of America, New York. Booth 28-B. Exhibiting: Noncorrosive material in various exhibits tending to show the forming, welding and finishing qualities. Representatives: F. B. Hufnagel, J. A. Mathews, A. T. Galbraith, R. E. Christie, E. P. Gaffney, R. H. Heatley, J. W. Taylor, J. D. White, T. W. Pennington, J. S. Ewing, F. Baskerfield, J. C. Woodward, P. E. Tobin, E. H. Walters, J. H. Jones, R. H. Fletcher, W. Stevenson, C. A. Oehring, J. A. Bespole, A. C. Paulson, K. S. Daniels, A. J. Schatke, D. K. Miller, F. A. Coddington, J. F. Taylor, R. B. Hayward and F. W. Weber.

D

DAILY METAL TRADE, Cleveland. Booth 25-D. Exhibiting: Copies of *Daily Metal Trade*, STEEL, *The Foundry, Abrasive Industry, Machine Design, Automotive Abstracts* and other periodicals of the Penton Publishing Co.; also technical books. The space will be fitted up as a rest room and all who attend the exposition are cordially invited to make their headquarters here. Representatives: C. J. Stark, J. D. Pease, E. L. Shaner, G. O. Hays, John Henry, L. C. Pelott, C. A. Wardley, E. F. Ross, J. D. Knox, A. H. Allen, F. B. Pletcher and Guy Hubbard.

DARDELET THREADLOCK CORP., New York. Booth 19-D. Exhibiting: Nuts, bolts and threaded parts; applications of the locking principle; and cutting tools for manufacturing locking threads. Representatives: Lucien C.

Sprague, Norman C. McLoud, William L. McKay, F. D. Moore and Edward J. McManus.

DARWIN & MILNER INC., Cleveland. Booth 17-B. Exhibiting: General line of alloy tool steel products; dies and tools made from oil-hardening non-deforming steel and air-hardening steel; form tool castings made from cobalt-chromium steel; and cobalt-chromium steel safety razor blades. Representatives: Victor Tlach, John C. Koch, H. L. Harrison and Charles F. Lear.

DEARBORN CHEMICAL CO., Chicago. Booth 6-D. Exhibiting: A chemically compounded rust preventive; rust-preventing wrappers; mill coat; a concentrated water soluble rust inhibitor; and powdered and liquid cleaners. Representatives: E. M. Converse, C. C. Rausch, C. I. Loudenback and J. A. Craenner.

DRIVER-HARRIS CO., Harrison, N. J. Booth 20-B. Exhibiting: A wide range of nickel-chromium heat-resisting alloy heat treating containers and furnace parts including cast and sheet carburizing boxes; die-cast pyrometer tubes; lead, salt and cyanide pots; dipping baskets; trays, rollers, fixtures and other furnace parts; bolts and nuts; retorts, mufflers and small intricate castings. Representatives: F. L. Driver Jr., F. V. Lindsey, J. M. Lohr, J. C. Bilek, Mr. Thornquist, J. B. Shelby, G. M. Pinney, W. E. Blythe, L. Prior, C. Pettit and Messrs. Hobbie and Eckley.

DURIRON CO., Dayton, O. Booth 43. Exhibiting: Pumps, exhaust fans, valves, tank rods, steam jets and welded pickling tank made from acid-resisting alloy. Representatives: M. W. Smith, G. A. Baker, N. E. Philpot, E. R. Suter and R. C. Schenk.

E

ECLIPSE FUEL ENGINEERING CO., Rockford, Ill. Booth in Gas Section. Exhibiting: New developments in combustion equipment for large gas-fired furnaces, including typical heat treating furnace, centrifugal blowers, automatic air and gas proportional mixers, automatic temperature controllers, high and low-pressure burners, and immersion-type heating equipment. Representatives: G. W. McKee, O. M. Olsen, K. A. Scharbau, D. A. Campbell, L. J. Strohmeyer, E. A. Stoner, C. H. Martin, O. N. Sellers, C. J. Michelet and P. L. Raymond.

ELECTRIC FURNACE CO., Salem, O. Booth 4-L. Exhibiting: Photographs of electric, oil, and gas-fired furnace installations, including new chain belt conveyor, pit-type, car-type, recuperative roller-hearth and rotary furnaces for annealing, carburizing, normalizing, enameling, nitriding, hardening, drawing, forging, billet heating and process heating; specially-built gantry cranes, charging machines and other labor-saving material handling equipment used in connection with furnaces; chain belt conveyor, cast metallic heating elements, roller rails and miscellaneous parts used in furnaces. Representatives: F. T. Cope, R. F. Benzinger, S. F. Keener, N. H. Knowlton, M. H. Mawhinney, A. H. Vaughan, G. P. Lozier, S. J. Eberwein, R. C. Oyster, A. F. Kingsley, A. E. Wright, C. L. West, K. U. Wirtz, W. S. Bowling, T. B. Bechtel, F. J. Peterson, B. C. Thompson, R. D. Thomas and W. M. Smith.

ELECTRIC STEEL FOUNDERS RESEARCH GROUP, Chicago. Booth 39-B Exhibiting: Miscellaneous small and medium-sized castings of carbon, alloy or special steels as made regularly by member foundries from metal produced in electric furnaces; physical test specimens; and other material indicative of group plant practice. Representatives: R. A. Bull and C. N. Ring.

ELKON DIVISION OF P. R. MALLORY CO. INC., Indianapolis. Booth 98. Exhibiting: Specimens of welding electrodes and dies for electric resistance welding; a motion picture in continuous operation showing typical die applications; electrical contacts; and a high-temperature electric furnace. Representatives: G. V. Rockey, E. W. Bremer, E. C. Howell, E. O. Oberdick and J. A. Weiger.

F

R. Y. FERNER CO., Washington. Booth 14. Exhibiting: Swiss jig boring machines; Swiss universal measuring machines; and French dilatometers of mechanical and photographic recording types. Representatives: R. Y. Ferner, Charles T. Ameel, S. E. Kenworthy, W. E. Bailey, Lambert G. Neff, A. W. Bissell and Walter S. Ryan.

FERRY CAP & SCREW CO., Cleveland. Booth 2-L. Exhibiting: Cap screws; set screws; milled studs; stand-

Iron and Steel Group Lists Nine Papers

PROVIDING additional scope to the varied technical program of National Metal week, the Iron and Steel division of the American Institute of Mining and Metallurgical Engineers will hold three technical sessions; one Monday morning dealing with iron ore; a joint session with the Institute of Metals on Tuesday afternoon, theoretical metallurgy to be discussed; and a third session Thursday morning at which alloys steels are to be considered. Headquarters for the iron and steel group as well as technical sessions will be confined to the Stevens hotel. A special feature of Monday afternoon will be an iron ore roundtable discussion lead by C. B. Murray, partner, Crowell & Murray, Cleveland. Tuesday evening the group will join with the Institute of Metals in a dinner at Stevens hotel, the speaker being Dr. B. D. Saklatwalla, vice president, Vanadium Corp. of America, Bridgeville, Pa., who will deliver a nontechnical address on the subject of vanadium. The program of technical papers and other activities for the Iron and Steel division for the week is as follows:

Monday, Sept. 22

MORNING

10:00 a.m.—Iron Ore session. Chairman: W. J. MacKenzie.

"Some Aspects of the Iron Ore Situation," by F. B. Richards, chairman, Hanna Furnace Co., Cleveland.

"Beneficiation of Iron Ores from the Blast Furnace Viewpoint," by Ralph Sweetser, assistant to first vice president, American Rolling Mill Co., Columbus, O.

"Resistance of Iron Ores to Decrepitation and Mechanical Work," by T. L. Joseph, supervising engineer, and E. P. Barrett, metallurgist, both of the North Central station, bureau of mines, Minneapolis.

AFTERNOON

2:00 p.m.—Iron Ore roundtable. Chairman, C. B. Murray.

Tuesday, Sept. 23

AFTERNOON

2:00 p.m.—Joint Session on Theoretical Metallurgy with Institute of Metals division. Chairman: S. L. Hoyt.

"Studies upon the Widmanstatten. I. Introduction. The Aluminum-Silver System and the Copper-Silicon System," by Robert F. Mehl, superintendent, and Charles S. Barrett, assistant physicist, division of physical metallurgy, Naval Research laboratory, Washington.

"Cemented Tungsten Carbide. A Study of the Action of the Cementing Material," by L. L. Wyman and F. C. Kelley, metallurgists, research laboratory, General Electric Co., Schenectady, N. Y.

"Transformation of Austenite at Constant Subcritical Temperatures," by E. S. Davenport and E. C. Bain, research laboratory, United States Steel Corp., Kearny, N. J.

EVENING

6:30 p.m.—Joint dinner with the Institute of Metals division.

Address: "Vanadium," by Dr. B. D. Saklatwalla, vice president, Vanadium Corp. of America, Bridgeville, Pa.

Thursday, Sept. 25

MORNING

8:00 a.m.—Nonferrous plant visitations.

10:00 a.m.—Alloys session. Chairman: Jerome Strauss.

"Practical Observations on the Manufacture of Basic Open-hearth, High-Carbon Killed Steel," by W. J. Reagan, assistant superintendent, open hearth, Edgewater Steel Co., Oakmont, Pa.

"Development of Casing for Deep Wells," by F. W. Bremmer, assistant superintendent of hot mills, Spang, Chalfant & Co. Inc., Ambridge, Pa.

"Manufacture of Basic Open-hearth Steel of Forging Quality," by William R. Fleming, Andrews Steel Co., Newport, Ky.

Alvina Lenke Studio

(Above) Chicago skyline with Chicago river in foreground and Merchandise Mart at left. (Right) Looking southeast from Dearborn street and the river showing the Pure Oil building at the right, Mather tower left

Underwood & Underwood

(Above) Merchandise Mart, housing a city of wholesalers, recently completed and said to be the world's largest building

Alvina Lenke Studio

Alvina Lenke Studio

(Above) Michigan avenue north from the bridge. (Left) View taken from within the Loop, showing northside skyscrapers and river

Underwood & Underwood

ard and special screws and bolts in alloy steels; connecting rod bolts; hardened and ground parts; and covered and semi-covered acorn nuts. Representatives: H. D. North, Herbert A. Keith, H. B. Pulsifer, A. L. Whittemore, W. J. Graham and W. M. Leach.

A. FINKL & SONS CO., Chicago. Booth 2-D. Exhibiting: Photographs of plant operations, forgings and die blocks. Representatives: C. E. Finkl, Fred Finkl, William Finkl, M. R. Chase, E. H. Graham, T. P. Wallace, W. H. Rieger, J. M. Curley and H. Berg.

FIRTH-STERLING STEEL CO., McKeesport, Pa. Booth 37-D. Exhibiting: Materials entering into the manufacture of tungsten carbide; representative tungsten carbide tools; and photographs of operations with high-speed tool and die steels. Representatives: L. G. Firth, D. G. Clark, G. L. Comstock, O. K. Parmiter, R. S. Stevick, A. S. Martin, M. F. Judkins, Frank Marth, C. G. Thoma, O. T. Smith, H. I. Moore, A. E. Barker, W. C. Royce, G. A. Jacobs, E. T. Jackman, W. J. MacFarland, J. V. Little, Al. Mattson, Ira A. Rabitoy, G. R. Bunting, A. M. David, E. W. Nelson, J. H. Johnson, R. F. Kimber, M. J. O'Brien, W. A. Ruppel, R. J. Varney, T. H. Garlick, Harry Jarvis, Fred Jarvis, D. E. Jackman Jr., W. A. Nungester, C. O. Ericke, T. A. Larecy, E. D. Roberts, H. E. Lennon, George J. Bauer, F. G. Davis, R. K. Koon, Albert R. Baker, Charles E. Hughes, Alan Jackman, William Loach, F. N. Mead, I. Olsen, L. S. Russell, Joseph Smith, George Sutcliffe, John Van Duyne and E. T. Broaddus.

J. B. FORD CO., Wyandotte, Mich. Booth 26. Exhibiting: Glass tanks showing methods for agitating metal cleaning solutions by air; and samples of metal cleaners. Representatives: B. N. Goodell, W. M. Cole, C. S. Tompkine C. R. Beaubien and H. W. Faint.

FUSION WELDING CORP., Chicago. Booth 106. Exhibiting: Welding equipment and supplies including portable and stationary arc welding generators of various capacities and welding rods for both electric and gas processes. Representatives: J. B. Green, L. F. Collins, Dana Summers, R. W. Holt, F. A. Green, M. P. Hare, R. O. Waldman, A. Bernard and R. F. Beazell.

G

GATHMANN ENGINEERING CO., Baltimore. Booth 33-B.

GEHNRICH OVEN CO. INC., Long Island City, N. Y. Booth in Gas Section. Exhibiting: Small continuous conveyor oven for automatic dip, drain and bake of finishes on metal parts; and photographs of ovens for baking finishes, low-temperature heat treating and core baking. Representatives: C. L. Gehnrich, A. V. Maday, H. P. Rasmussen, H. Gehnrich and P. Kriegel.

GENERAL ALLOYS CO., Boston. Booth 22. Exhibiting: Chrome-nickel heat-resisting alloy and products made from it, including carburizing and annealing containers; cyanide and lead pots; furnace hearths, roller rails, heat and acid-resisting chain, cyanide dipping baskets, recuperators and miscellaneous parts for carburizing, annealing, normalizing, hardening, tempering, forging and spheroidizing furnaces; tubes and retorts. Representatives: H. H. Harris, W. K. Leach, G. C. McCormick, F. J. Blaney, W. R. Blair, E. E. Armory, H. G. Chase, R. M. Kirk, Ralph Hare, A. L. Grinnell, E. R. Dougherty, R. W. Herrick, J. J. Donovan, C. P. Mills and J. C. Van Arman.

GENERAL ELECTRIC CO., Schenectady, N. Y. Booth 80. Exhibiting: Heat treating furnace; air-draw furnace and oven; melting pots; lead-brazed parts; floor welder and control; hardening furnace; samples of copper arc-welding equipment; ammonia dissociator; and welding electrodes. Representatives: F. W. McChesney, C. L. Ipsen, H. J. Babcock, G. E. Messer, R. E. Welton, H. E. Scarbrough, H. E. Lewis, G. R. Brophy, F. C. Kelly, R. H. Harrington, L. Wyman, E. N. Downing, P. P. Alexander, J. W. Belanger, E. Von Steeg Jr., H. O. Westendarp, J. A. McCullough, E. A. Swiedom, H. P. Doud, M. A. Havenhill, J. W. McFarland, F. Klass, F. V. Wenzell, F. S. Peasley, W. M. B. Brady, R. C. Anderson, O. A. Tilson, V. J. Chapman, I. F. Weller, R. M. Stephens, B. C. Tracey and L. D. Meeker.

GENERAL ELECTRIC X-RAY CORP., Chicago. Booth 15-B. Exhibiting: Radiographs showing how X-rays have been employed successfully in inspection of high-pressure fittings and in correcting foundry practices by determining the extent and nature of defects; and a series of Laue diffraction patterns showing the effect of rolling sheet metal and heat treatment. Representatives: E. W. Page, W. C. Dee, S. Nielson, E. E. O'Donnell and W. B. Andrews.

GENERAL SPRING BUMPER CORP. Division of Houdaille-Hershey Corp., Detroit. Booth 4-F. Exhibiting: Machine for polishing set-up, saving time and giving longer wheel life. Representatives: Charles F. U. Kelly, B. M. Short, F. A. Cornell, J. B. O'Neill, C. G. Griffiths and R. R. Tompkins.

GLOBAR CORP., Niagara Falls, N. Y. Booth 53. Exhibiting: High-temperature electric furnace equipped with electric heating elements and terminal accessories. Representatives: A. H. Heyroth, K. E. Rogers, B. A. Bovee, L. C. Loshbough, N. H. Berry and W. S. Evans.

CLAUD S. GORDON CO., Chicago. Booth 34-D. Exhibiting: Pyrometer equipment including thermocouples, switches, lead wire, protecting tubes, insulators and other accessories of a special nature and design for regular and special application. Representatives: Claud S. Gordon, A. W. Anderson, Richard Schoenfeld and S. A. Silbermann.

GRAY IRON INSTITUTE INC., Cleveland. Booth 45-B. Exhibiting: Test bars of various types of gray cast iron; engineering data; and results of investigations of interest to the engineer and production executive. Representatives: Arthur J. Tuscany and Charles E. Mitchell.

GREAT LAKES FORGE CO., Chicago. Booth 20-D. Exhibiting: Drop forgings ranging in weight from 1 ounce to 100 pounds; and typical drop forge dies showing various operations in making forgings. Representatives: G. C. Hodgson, W. C. West, C. A. Lamb, A. M. Steever and R. J. Geisler.

H

GEORGE J. HAGAN CO., Pittsburgh. Booth 47. Exhibiting: Descriptions of all types of industrial furnaces, including designs, photographs and performance data on many new and improved types of heat treating equipment using oil, gas, coal and electricity as a heating medium. Representatives: R. E. Talley, C. F. Cone, V. A. Hain, J. Sandberg and A. D. Dauch.

HALCOMB STEEL CO., Syracuse, N. Y. Booth 28-B. Exhibiting: Corrosion and heat-resisting steels and alloys with typical applications; all grades of tool steels from ingot to finished bar. Representatives: R. H. Dougherty, H. A. Pardee, J. T. Leyden, H. J. Stagg, H. L. Day, J. H. Hinkley, J. F. Kirwan and H. O. Lang.

HAUCK MFG. CO., Brooklyn, N. Y. Booth 12-A. Exhibiting: Oil regulating valves in four sizes and triple atomizing low-pressure oil burners in four sizes . Representatives: J. Escheman, C. Stockman and F. Schweigerdt.

C. I. HAYES INC., Providence, R. I. Booth 38. Exhibiting: High-speed steel hardening furnace equipped with atmosphere control to prevent decarburization, pitting or grain growth. Representatives: Carl I. Hayes, James E. Hines, Carl G. Paulson and Charles H. Myrick.

HAYNES STELLITE CO., Kokomo, Ind. Booth 82. Exhibiting: Cutting tools of special alloy and cast tungsten carbide; self-hardening welding rod; corrosion and heat resisting castings; and a demonstration of deposition of special welding rod on wearing surfaces to prolong life of parts. Representatives: E. F. Smith, W. A. Becker and F. P. Shephard.

HEPPENSTALL CO., Pittsburgh. Booth 7-L. Exhibiting: Descriptive material on alloy steel, die blocks, trimmer steels, solid steel four cutting edge shear knives and heavy forgings. Representatives: C. W. Heppenstall, B. B. Weinberg, D. A. Stuart, F. C. Moyer, J. A. Succop, A. L. Wurster, G. I. Allen, L. A. Daines, A. J. Porter Jr., C. J. Sauer, G. O. Desautels and O. W. Mueller.

HEVI DUTY ELECTRIC CO., Milwaukee. Booth 79. Exhibiting: Electric vertical pressure carburizing furnace with complete temperature control and carburizing gas mixing machine; pot-type furnace for hardening and drawing operations; small box-type furnace with electromagnetic winding for determining Ac_2 point of steels submerged in cyanide bath; box-type toolroom furnace with electromagnetic winding for determining Ac_2 point. Representatives: E. L. Smalley, F. A. Hansen, W. B. Cooley, E. R. Brandau, F. J. Condit, J. S. Ayling, L. W. Hayden, E. G. Craig, C. H. Stevenson, H. L. Dunn and F. Bathke.

HOLCROFT & CO., Detroit. Booth 49. Exhibiting: Engineering data on heat treating furnaces. Representatives: C. H. Martin, Bill Linsay, C. L. Joy and R. T. Cadwell.

HOSKINS MFG. CO., Detroit. Booth 30. Exhibiting: Small electric box-type furnace with ribbon heating units and equipped with automatic temperature control; resistance wire and ribbon; and indicating pyrometers. Representatives: C. F. Busse, F. D. Archer, C. S. Kinnison, W. D. Little and W. A. Gatward.

E. F. HOUGHTON & CO., Philadelphia. Booth 35-B. Exhibiting: Carbonizing materials; quenching and tempering oils; liquid heating media for hardening or tempering; cutting oils; rust preventives; and pickle controls. Representatives: G. W. Pressell, H. E. Cressman, G. S. Rogers, Wilbur J. Wright, R. S. Crowell, F. J. Elliott, Reese Nelson, E. H. MacInnes, E. H. Kellogg, M. B. Skipper, W. L. Spencer, H. W. Vanderwall and Carl Wickbom.

HYRO MFG. CO. INC., New York. Booth 77. Exhibiting: An automatic industrial furnace for case hardening with cyanide and other salts or other heat treating operations. Representatives: Charles J. Martin.

I

ILLINOIS STEEL CO., Chicago. Booth 12-14. Exhibiting: Chromium steel containing 12-14 and 16-18 per cent chromium; chromium-nickel steel of 18-8 composition in plates, structural shapes and bars. Representatives: W. I. Howland Jr., R. Korsan, S. L. Graham, G. A. Price, J. B. Hammond, R. G. Glass, F. S. Crane, G. Bendall, F. Bendall, E. Davidson, G. Fisher, F. B. Mulvaney, C. R. Moffatt, A. R. Willard, H. W. Parker, W. S. Saylor, J. H. McKown, J. Hornbrook,

O. W. Landrus, E. E. Price and C. A. Sudor.

ILLINOIS TESTING LABORATORIES INC., Chicago. Booth 26-D. Exhibiting: Stationary and portable indicating pyrometers; portable apparatus for measuring temperature of molten nonferrous metal; portable apparatus for measuring temperature in annealing ovens and furnaces; thermocouples; and pyrometer accessories. Representatives: J. A. Obermaier, M. D. Pugh and C. L. Schmal.

ILLINOIS TOOL WORKS, Chicago. Booth 10-L. Exhibiting: Metal cutting tools; lock washers and locking terminals; and tool holders, vises and clamps. Representatives: Harold C. Smith, F. W. England, C. L. Johnson, P. J. Nelson, J. M. Gribbie, C. J. Irwin, S. O. Bjornberg, A. W. Swanson, R. P. Leiner, J. LaBuda, E. E. Valy, F. W. Dority, William Holly, A. W. Long and W. V. Klimmer.

INTERNATIONAL NICKEL CO. INC., New York. Booth 10-D. Exhibiting: Examples of industrial applications of nickel and nickel alloys. Representatives: T. H. Wickenden, C. McKnight, A. L. Roberts, F. B. Coyle, J. S. Vanick, A. G. Zima, H. J. French, J. W. Sands, R. L. Suhl, R. Cooper Jr., W. C. Kerrigan, R. A. Wheeler, H. S. Lewis, E. J. Bothwell and F. H. Villaume.

IVIN'S STEEL TUBE WORKS, Philadelphia. Booth 36-D. Exhibiting: Seamless chrome-molybdenum tubing; and seamless stainless steel tubing, low and high-carbon seamless steel tubing; and seamless aluminum and duralumin tubing. Representatives: Elwood Ivins, Horace S. Kircher, J. B. Cording and Stanley Jeffries.

J

JESSOP STEEL CO., Washington, Pa. Booth 47-B. Exhibiting: Tool steel bars and samples of finished products; sheet steel of tool steel quality for all kinds of saws; finished saws of various descriptions; stainless steel bars, sheets, plates and strips; articles made up of stainless steel to illustrate the various uses and applications of this steel; and die steels and finished dies. Representatives: S. A. Grayson, R. E. Emery, F. T. H. Youngman, R. J. Murray II, R. E. Malmberg, A. C. Graham, D. J. Hanna, V. M. Wellman, R. M. Paxton Jr., A. W. Lucas, W. J. Frederick, M. W. Singer, J. S. Marlowe, J. C. Dawson and A. G. Lambert.

JOHNSTON MFG. CO., Minneapolis. Booth 12. Exhibiting: Valveless automatic controller for metering heavy, viscous fuels, reverse blast low-pressure burners for metal heating furnaces and an oil-fired blacksmith forge. Representatives: W. E. Johnston, O. B. Duncan, A. L. Datesman and J. R. Mathews.

JONES & LAUGHLIN STEEL CORP., Pittsburgh, Booth 3-L Exhibiting: Samples of hot and cold-finished steel; and oil paintings of bessemer and open-hearth steelmaking scenes of the company's works at Pittsburgh and Aliquippa, Pa. Representatives: J. D. Allen, C. D. Burns, R. T. Rowles, A. A. Wagner and M. A. Blessing.

Mechanical Engineers' Program Complete

EIGHT technical sessions comprise this year's program of the two divisions of the American Society of Mechanical Engineers which are taking part in the National Metal congress. The machine shop practice division and the iron and steel division are the two groups; each is sponsoring four technical sessions. The machine shop practice division has arranged sessions Tuesday afternoon and evening, Wednesday morning and afternoon; the iron and steel division will hold meetings Thursday and Friday, morning and afternoon. Papers to be presented Wednesday dealing with polishing, repairing and nitriding will probably be of interest to both divisions and consequently there will be some overlapping of interest; however, the program has been arranged with this in view.

Members of the mechanical engineers' divisions are invited to participate in inspection trips which the American Society for Steel Treating has arranged for 8:15 a.m. each day of the week except Monday. The A.S.M.E. banquet will be held Wednesday evening at Stevens hotel which is also the location for all technical sessions and registration headquarters for the two divisions.

The detailed program for the machine shop practice and iron and steel divisions of the American Society of Mechanical Engineers is as follows:

Tuesday, Sept. 23

AFTERNOON

2:00 p.m.—Technical session.

"Phenol Resinoid Molding Technique—Consideration of Engineering Factors Involved in the Replacement of Metals by Synthetic Plastics," by Leon V. Quigley, Bakelite Co., New York.

"Production of Plastic Telephone Parts," by A. M. Lynn, Western Electric Co., Chicago.

EVENING

8:00 p.m.—Technical session.

"Flange-Type Motor Mountings," by Herbert Chase, McGraw-Hill Publishing Co., New York.

"Mechanical Design of Electric Motors as Regards Standardization and Interchangeability," by J. L. Browne, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

Wednesday, Sept. 24

MORNING

10:00 a.m.—Technical session.

"Automatic Polishing," by Robert T. Kent, Devine Bros., Utica, N. Y.

"Repair of Worn Parts by Electrodeposition of Iron," by T. P. Thomas, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

AFTERNOON

2:00 p.m.—Technical session.

"Case Hardening with Ammonia Gas," by Dr. V. O. Homerberg and J. P. Walsted, Massachusetts Institute of Technology, Cambridge, Mass.

"Nitriding Analyses—Their Physical Properties and Adaptability," by Robert Sergeson and M. M. Clark, Central Alloy division, Republic Steel Corp., Canton, O.

EVENING

6:30 p.m.—Joint banquet of iron and steel and machine shop practice divisions.

Thursday, Sept. 25

MORNING

10:00 a.m.—Technical session.

Report of antifriction heavy-duty bearing commitee.

"General Design and Construction of Hot Saws for Cutting Heavy Structural Steel Sections," by A. B. Pearson, Carnegie Steel Co., Munhall, Pa.

AFTERNOON

2:00 p.m.—Technical session.

"Manufacture of Large Weldless Forged Steel Pressure Vessels," by J. L. Cox, Midvale Co., Nicetown, Philadelphia.

"Manufacture of Large Welded Pipe," by Leon Cammen, consulting engineer, New York.

"Straightening of Steel by Rolling," by J. Blair Sutton, Sutton Engineering Co., Pittsburgh.

Friday, Sept. 26

MORNING

10:00 a.m.—Technical session.

"Application of Metallic Recuperators to Industrial Furnaces," by G. W. Mantle, Surface Combustion Co., Pittsburgh.

"Continuous Reheating Furnace for Rolling Mills," by A. L. Culbertson, Rust Engineering Co., Pittsburgh.

"Manual Semiautomatic Devices for the Protection Against Wind of Ore Bridges and Similar Structures," by C. O. Burton, Minnesota Steel Co., Duluth, Minn.

AFTERNOON

2:00 p.m.—Technical session.

"Notes on the Production, Purification and Uses of Blast Furnace Gases," by W. A. Haven, Arthur G. McKee & Co., Cleveland.

"Combustion of Gas in Blast Furnace Stoves," by H. W. Paret Jr., Swindell-Dressler Co., Pittsburgh.

K

KELLER MECHANICAL ENGINEERING CORP., Brooklyn, N. Y. Booth 8-A. Exhibiting: Flexible shaft machine; auto body sanding and polishing machine on small roller floor stand with ring angle sanding and polishing equipment; high-speed flexible shaft machine for shaft speeds direct into the handpiece; machine equipped with two shafts, one for heavy work at slow speed and one for light work at high speeds; undercutting attachment for cutting mica; filing attachment; chipping hammer; slow-speed attachment; and line of rotary files consisting of over 200 different shapes and cuts. Representatives: H. P. Loewenberg, P. C. Reno, W. M. Rieman and J. J. Walsh.

J. W. KELLEY CO., Cleveland. Booth 12-D. Exhibiting: Acid inhibitor for pickle bath; drawing compound for stainless steel; and other metal working products. Representatives: J. W. Kelley, J. E. Burns, H. B. Northrup, C. F. Boyd, H. M. Webb, E. C. Redlin and B. O. Platell.

KELLEY-KOETT MFG. CO. INC., Covington, Ky. Booth 8-F. X-ray equipment for industrial enterprises; and radiographs. Representatives: J. R. Kelley, W. S. Werner, C. A. Poole, E. B. Graves and G. M. McFedries.

KEMP MFG. CO., Baltimore. Booth in Gas Section. Exhibiting: System for efficient utilization of gas for industrial process heating; gas-fired immersion metal melting equipment; and burner equipment for all types of industrial heating operations. Representatives: E. B. Dunkak. W. M. Hunt, W. S. Bassett and F. H. Andrews.

CHARLES F. KENWORTHY INC., Waterbury, Conn. Booth 28-D.

K-G WELDING & CUTTING CO. INC., New York. Booth 104. Exhibiting: Oxyacetylene welding and cutting apparatus. Representatives: W. D. Flannery, A. W. Carr, F. O. Weber and H. H. Kress.

KINITE CORP., Toledo, O. Booth 3-B. Exhibiting: Tool steel castings; alloy iron castings; patterns; stampings; steel bars; and dies and molds. Representatives: R. H. Herbst, W. G. Salkeld and F. E. Spartz.

CHARLES KLEIST & SON, Jamestown, N. Y. Booth 24-D. Exhibiting: Miniature board hammer; display of drop hammer boards of the standard type; special built-up type drop hammer boards; and laminated hammer boards and ram pins. Representative: H. E. Kleist.

KLOSTER STEEL CORP., Chicago. Booth 21-Ba. Exhibiting: Samples of Swedish steel including chrome-nickel, chrome-vanadium, tungsten, cobalt and molybdenum composites; tool steels; cutlery steel; hot and cold-rolled strip steel; band saw steel; ball bearing steel; razor blade steel; magnet steel; file steel; spring steel; clock spring steel; beveled shoe knife steel; knife steel; rolled figured steel; sectional steel; wire rods; rolled wire; skate steel; band iron; hollow staybolt iron; solid staybolt iron; charcoal pig iron; and Swedish ores. Representatives: Einar Lindeblad and Max Weisner.

L

LEEDS & NORTHRUP CO., Philadelphia. Booth 5. Exhibiting: Demonstration of potentiometer principle; anticipating potentiometer control equipment; indicating and recording pyrometers in vapor-proof cases; recording controllers; checking potentiometers; hardening furnace; nitriding furnace; and tempering furnace. Representatives: G. W. Tall, A. E. Tarr, Jordan Korp, E. H. Carlson, W. A. Lane, T. C. Smith, J. A. Dow, H. F. Coyle, E. Bentsen, C. O. Anderson, H. Brewer, E. B. Estabrook, P. H. Taylor, A. F. Moranty, O. Brewer, E. C. Wahl, W. D. Trueblood, R. E. Hansen, T. C. Bennett and M. B. Fisher.

E. LEITZ INC., New York. Booth 1-L. Exhibiting: Instrument for the microscopic examination of metals; instrument which registers automatically and also photographs the thermal changes of metal as they approach temperatures on the viscosity border; illuminator affording a means for examining metal specimens; a complete line of grinding and polishing machines for metallographic specimens with automatic specimen holder; and a portable metal microscope for both routine and research work. Representatives: R. Tvestmann, O. Soetbeer and A. I. Buehler.

LINCOLN ELECTRIC CO., Cleveland. Booth 90. Exhibiting: Polyphase induction motors of sleeve and ball bearing types, open or fully enclosed fan cooled; push button starter for up to 30 horsepower; motor operating under water; machine for carbon arc welding; hand welding equipment; electrodes; and a complete line of samples of welded articles. Representatives: A. F. Davis, R. A. Davidson, H. M. Downing, F. O. Erickson, John C. Ardagh, H. F. Nye and A. E. York.

LINDBERG STEEL TREATING CO., Chicago. Booth 16-D. Representatives: A. N. Lindberg, L. A. Lindberg, E. C. Kohler, P. J. Norton, H. E. Lindberg and B. C. Cleveland.

LINDE AIR PRODUCTS CO., New York. Booth 82. Exhibiting: Oxyacetylene welding and cutting equipment. Welded specimens will be tested in tensile strength testing machine each day. Representatives: H. F. Bulkley, T. C. Fetherston, H .H. Griffith, R. Tull, D. J. Hayden, M. Burnett, C. E. Ziesel, M. Wade, W. B. Browning, F. C. Hasse, J. B. Dunlop and J. W. Haygood.

LUDLUM STEEL CO., Watervliet, N. Y. Booth 7-B. Exhibiting: High-speed steel; die steels; chisel steel; carbon tool steels; and various applications of these steels. Representatives: A. F. Dohn, C. B. Templeton, F. B. Lounsberry, Harry Hardwicke, W. G. Zetsche, Edwin Oeser, R. E. Surtees and W. H. Wills.

M

MADISON-KIPP CORP., Madison, Wis. Booth 1. Exhibiting: Automatic die casting machine; and air grinders and accessories. Representatives: A. T. Lillegren, T. E. Coleman, J. A. Coleman, J. A. Courter, A. S. Kidd, T. C. Korsmo, F. R. Clark and R. Schultz.

PAUL MAEHLER CO., Chicago. Booth in Gas Section. Exhibiting: Gas-fired direct convection heater for tempering, drawing, normalizing, mold and core baking; interior view of heater; electrical control cabinet; and automatic temperature and safety controls. Representatives: A. E. Maehler, H. R. Madson and H. R. Fox.

MAHR MFG. CO., Minneapolis. Booth 60. Model belt conveyor furnace; individual, direct-connected blower; new triple atomizing type burner; and safety automatic shut-off valves; and auxiliary equipment. Representatives: W. G. Barstow, C. F. Olmstead, B. G. Harmon, C. W. Rudolph, A. E. Stenzel and A. F. Tenney.

MARBURG BROS., New York. Booth 21. Exhibiting: Precision die sawing and filing machine. Representatives: Theodore H. Marburg, O. P. Brett, Richard Krause and F. Wenzel.

MAXON PREMIX BURNER CO., Muncie, Ind. Booth in Gas Section. Exhibiting: Industrial fuel-burning equipment consisting of blower-type gas burners, inspirating-type gas burners, motor-driven automatic control valves and solenoid safety valve. Representative: R. W. Jackson.

METAL & THERMIT CORP., Chicago. Booth 101. Exhibiting: Samples of heavy-welded sections. Representatives: H. D. Kelley, C. D. Young and A. F. Beaulieu.

MICHIANA PRODUCTS CORP., Chrobaltic Tool Division, Michigan City, Ind. Booth 36-B. Exhibiting: Heat resisting containers; carburizing and annealing boxes; cyanide, lead and salt pots; tubes and retorts; dipping baskets; furnace parts, including grids, muffles, rails, hearths, and fixtures; sheets, fabricated shapes, etc. Representatives: W. B. Sullivan, H. Klouman, L. H. Whiteside, A. A. Cash, J. F. Sweeney, C. M. Conner, E. E. Whiteside and J. W. Mull Jr.

MICHIGAN STEEL CASTINGS CO., Detroit. Booth 3. Exhibiting: Model furnace demonstrating the use of chain and furnace parts for conveying material through heating and heat-treating furnaces; drive with counter-weighted compensators; standard and special chains for industrial furnace use; corrugated trays for pusher furnace work; seamless thermocouple protection tubes; sheet carburizing boxes; sheet dipping baskets and other fabricated dipping racks; fixtures, fixed-axle type roller rail; and a replaceable wearing strip rolling mill twist guide. Representatives: F. J. Stanley, E. D. Flinterman, J. D. Corfield, Ralph T. Crean and W. E. McGahey.

MIDVALE CO., Philadelphia. Booth 22-B. Exhibiting: Forgings; heat resisting and corrosion-resisting castings; and tool steels. Representatives: Dr. H. L. Frevert, Stuart Hazlewood, Henry Ziesing, Francis B. Foley, Howard Myers, A. Hamilton, H. E. Rowe, Frank Sleath, Fred Sager, W. B. Smyth, LeRoy Berkey, T. G. Besom and J. R. Adams.

ALEXANDER MILBURN CO., Baltimore. Booth in Gas section.

A. MILNE & CO., New York. Booth 5-B. Exhibiting: Tool and die steels; hollow, solid and auger drill steels; special sections; Swedish Lancashire iron; cold drawn electrical iron; anvils; forged tools; file steel; cutlery sheets; aircraft tubing; ball bearing steel and capillary tubing for diesel engines. Representatives: Henry Sears Hoyt, V. A. Greene, H. R. Adams, W. McIlwrath and Miss M. Trusten.

MINNEAPOLIS-HONEYWELL REGULATOR CO., Minneapolis. Booth 1-B. Exhibiting: Motor-operated valves for fuel-air control of industrial furnaces; damper regulating motors; motor-operated automatic shut-off valves for low pressure oil and gas service; motor-operated final safety shut-off valves for higher pressure application; motorized standard regulating valves; solenoid-operating valves; electric contract temperature controllers; electric contract pressure controllers; combustion safety controllers; relays of small capacities; and automatic thermostatic controls for unit heaters.

Representatives: R. L. Goetzenberger, W. G. Jennings, R. G. Taylor, J. E. Kelly, L. H. Plum, J. E. Haines, J. S. Gaines and Paul F. Shivers.

MODERN ENGINEERING CO., St. Louis. Booth 107. Exhibiting: Welding and cutting equipment. Representatives: A. J. Fausek, I. F. Fausek, John J. Keane, Walter Smith and W. J. Lacey.

MOLYBDENUM CORP. OF AMERICA, Pittsburgh. Booth 8-L. Exhibiting: Products of tungsten and molybdenum, including ferroalloys and salts; and chemical products of these two products including sodium molybdate, sodium tungstate, ammonium paratungstate and ammonium molybdate. Representatives: C. Taylor and W. H. Phillips.

MORSE TWIST DRILL & MACHINE CO., New Bedford, Mass. Booth 31-B. Exhibiting: High Speed and carbon twist drills, reamers, milling cutters, taps and dies; and special tools. Representatives: W. T. Read, F. O. Lincoln, J. Gordon Barr and B. F. Mansur.

N

NEW JERSEY ZINC CO., New York. Booth 1. Exhibiting: Zinc base die castings; and finished products made principally of die cast parts. Representatives: F. C. Fuller, W. P. Hardenbergh Jr., R. M. Neumann, J. W. Matthias, R. M. Curts, S. E. Maxon, C. R. Maxon, R. Davison and R. L. Davis.

NORTHWESTERN MFG. CO., Milwaukee. Booth 93. Exhibiting: Arc welder operated by electric motor; and arc-welding torch for welding or brazing steel or copper, or aluminum, by the use of a filler rod. Representatives: W. J. Aitken, E. C. Cauluwaert, K. L. Hansen, K. Franzen, W. F. Johnson and R. G. Mason.

NORTON CO., Worchester, Mass. Booth 6. Exhibiting: Grinding wheels; and refractories. Representatives: H. K. Clark, R. W. Cornish, K. W. Bird, W. H. Henson and F. H. Stenberg.

O

OHIO STEEL FOUNDRY CO., Springfield, O. Booth 26-B. Exhibiting: A centrifugally cast alloy tube; cast and sheet heat-resisting carburizing containers, centrifugal roll and other heat-resisting alloy castings. Representatives: W. J. Gilmore, F. K. Ziegler, J. F. Monfils, D. W. Talbott, W. A. Toohill and Frank Morrow.

TINIUS OLSEN TESTING MACHINE CO., Philadelphia. Booth 25-B. Exhibiting: Direct motor-driven brinell hardness tester; ductility testing machine equipment, for sheet mill; tensile testing machine with automotive drive, a dynamic balancing machine for balancing rotating parts; and static balancing machine for balancing rotating parts statically. Representatives: R. B. Lewis, H. H. Gildner, Bruce L. Lewis and J. Millane.

P

PAGE STEEL & WIRE CO., New York. Booth 78. Exhibiting: A complete line of welding wires. Representatives: J. J. Flaherty and E. J. Flood.

PARK CHEMICAL CO., Detroit. Booth 4-B. Exhibiting: Line of case hardening and heat treating materials including case hardening compounds, cyanide mixtures, drawing salts, lead pot carbon, cleaning compounds, etc. Representatives: J. N. Bourg, F. W. Faery Jr. and J. C. Thompson.

HENRY PELS & CO. INC., New York. Booth 20.

PENTON PUBLISHING CO., Cleveland. Booth 25-D. Exhibiting technical and commercial books and periodicals dealing with heat treating, forging, welding metallurgy and other phases of the metalworking industry. Rest room for those desiring to confer in quiet. Copies of STEEL, *Daily Metal Trade, The Foundry, Abrasive Industry, Machine Design, Automotive Abstracts* and other Penton publications will be available. Representatives: C. J. Stark, J. D. Pease, E. L. Shaner, G. O. Hays, John Henry, L. C. Pelott, C. A. Wardley, E. F. Ross, J. D. Knox, A. H. Allen, F. B. Pletcher and Guy Hubbard.

PERMUTIT CO., New York. Booth

Seventeen Plants on Visitation List

INTERESTING inspection trips covering a range of sights from pig iron to pigs' feet, the former at the plant of the Illinois Steel Co., and the latter at the Swift & Co., known more familiarly as the "stockyards," will be available for visitors to the National Metal congress. Four trips have been arranged for Tuesday; five for Wednesday; three for Thursday; and five for Friday. Buses leave the Seventh street entrance to Stevens hotel at 8:15 a.m. each day. Members and guests of all societies are invited and are requested to purchase bus tickets in advance. Plants on the visitation list, including representatives of most all ferrous and nonferrous metal industries in the Chicago district, whose address are shown, are as follows:

TUESDAY, SEPT. 23

8:15 A.M.

International Harvester Co., West Pullman Works, 1015 West 120th street. (Manufacture of "collateral" automotive equipment.)

Illinois Steel Co., South Works, 3486 East Eighty-ninth street. (Complete steel mill.)

Great Lakes Forge Co., 1220 West 119th. (Modern drop forge plant.)

Fusion Welding Co., 10257 Torrence avenue. (Drawing and processing of welding wire and rods.)

Carbo Oxygen Co., (Separation of oxygen by fractional distillation.)

WEDNESDAY, SEPT. 24

8:15 A.M.

Crane Co., 4100 South Kedzie avenue. (Manufacture of valves, fittings and plumbing accessories.)

Liquid Carbonic Corp., 3100 South Kedzie avenue. (Manufacture of fountain and cold storage equipment.)

American Forge Co., 2621 South Hoyne avenue. (Manufacture of upset forgings.)

Sivyer Steel Castings Co., 3100 South Wood street. (Manufacture of carbon and alloy steel castings.)

International Harvester Co., Tractor Works, 2600 West Thirty-first boulevard, (Manufacture and assembling of tractors.)

THURSDAY, SEPT. 25

8:15 A.M.

International Lead Refining Co., 151st street and McCook avenue, East Chicago, Ind. (Lead refining.)

Western Electric Co., Hawthorne Works, Forty-eighth avenue and West Twenty-second street. (Manufacture of telephone and talking picture equipment.)

American Steel Foundries Co., 138th street and Michigan street, Indiana Harbor, Ind. (Steel castings.)

FRIDAY, SEPT. 26

8:15 A.M.

A. Finkl & Sons Co., 1326 Courtland street. (Production of heavy forgings.)

Lindberg Steel Treating Co., 218 Union Park Court. (Commercial heat treating plant.)

Dallas Brass & Copper Co., 820 Orleans street. (Brass and copper mill.)

Aetna Ball Bearing Mfg. Co., 4600 Schubert avenue. (Ball bearing manufacture.)

Swift & Co., Packers and Exchange avenues, Union Stock Yards. (Meat packing and preparation.) This plant will be open to visitors on Tuesday, Wednesday, Thursday and Friday. Parties will be conducted through the plant at 9:15 and 10:30 a.m.

2. Exhibiting: Water softener with attached saturator, an electrochemical feed, float tank and control mechanism; and a carbon dioxide indicator and recorder. Representatives: F. S. Dunham, I. J. Bready, H. M. Olson and H. G. Taylor.

PITTSBURGH INSTRUMENT & MACHINE CO., Pittsburgh. Booth 24. Exhibiting: Brinell testing machines, hand and power-operated; metal sheet testers; metallographic grinder; brinell calibrator; brinell microscope; depth indicator for brinell tests; direct reading instrument for brinell machines; and special tester with 2 millimeter steel ball and diamond indentor. Representatives: Paul Kammerer and Charles Trueg.

PRESSED STEEL CO., Wilkes Barre, Pa. Booth 44-B. Exhibiting: Carburizing and annealing containers, perforated sections; welded and seamless formed products of chrome and chrome-nickel alloys. Representatives: Charles B. D. Wood, J. H. Mac Veigh and F. A. Schmidt.

PRODUCTION MACHINE CO., Greenfield, Mass. Booth 73. Exhibiting: Counterless feed grinding and polishing machines. Representatives: A. H. Behnke, T. A. Welch and P. A. Koerber.

R

REEVES PULLEY CO., Columbus, O. Booth 8-A. Exhibiting: Variable-speed transmission, incorporating recent improvements and refinements; new designs of electrical remote and electrical automatic controls showing the manner in which infinite variable-speed regulation of any heat-treating furnace of the continuous type, conveyor or machines may be adjusted in speed from one or more push button stations or, for certain installations, entirely automatically. Representatives: C. L. Irwin, A. E. Shibley, C. M. Reeves, F. T. Moore, H. M. Glessner and E. C. Schrade.

GEO. P. REINTJES CO., Kansas City, Mo. Booth 32. Exhibiting: Nonmetal furnace arch built of interlocking tile. Representatives: G. P. Reintjes, C. S. Whitman, J. L. Mayer and F. E. Oswald.

REPUBLIC FLOW METERS CO., Chicago. Booth 14-B. Exhibiting: A complete line of indicating and controlling pyrometers, a new control pyrometer which will handle directly any load up to 10 kilowatts without the use of auxiliary panels, and a model recently developed for 3-position control practice. Representatives: George S. Hendrickson, George D. Conlee, Albert Spitzglass, E. Schneider, S. C. Vail, W. L. Eckdhal and T. E. Bell.

REPUBLIC STEEL CORP., Youngstown, O. Booth 16-B. Applications of alloy steels; copper molybdenum iron; stainless irons; nitrided steel; bolts and nuts and die-rolled products. Representatives: J. M. Schlendorf, M. H. Schmid, G. F. Hess and M. J. R. Morris.

RIEHLE BROS. TESTING MACHINE CO., Philadelphia. Booth 1-F.

JOHN A. ROEBLING'S SONS CO., Trenton, N. J. Booth 102. Exhibiting: Welding wire.

ROESSLER & HASSLACHER CHEMICAL CO., New York. Booth 11-B. Exhibiting: Chemicals used in case hardening, heat treatment and heat coloring of steel; chemicals used in electroplating of metals; demonstrating the electroplating of copper, cadmium and zinc on steel and a new method for the approximate determination of cyanide in case-hardening baths; and samples illustrating the application of electroplating and heat treatment of steel. Representatives: Walter M. Gager, Charles H. Proctor, D. A. Holt, A. C. Stepan, W. Nissen and A. Papp.

RUSTLESS IRON CORP. of America, New York. Booth 21-D.

RYAN, SCULLY & CO., Philadelphia. Booth in Gas Section. Exhibiting: Photographs of recent installations, gas and combination gas and oil burners and sections of conveyor belts. Representatives: F. J. Ryan, G. A. Webb, W. N. Goggin and H. L. Mills.

JOSEPH T. RYERSON & SON, Chicago. Booth 7-D. Exhibiting: Samples of stainless, tool, alloy and cold-finished steels and other general steel products; movie showing method of handling orders through warehouse plants. Representatives: C. Van Dyke, A. Y. Sawyer, H. B. Ressler, W. H. Bryant, W. A. Marshall, C. S. Hagel and H. J. Walker.

S

GEORGE SCHERR CO., INC., New York. Booth 14-L. Exhibiting: A new contour measuring projector, toolmaker's microscope, measuring microscope, and optical dividing head, an optical division checking devise, an optical precision length measuring machine, and a universal measuring and locating microscope. Representatives: George Scherr, Fritz Konig and R. P. Friis.

SELAS CO., Philadelphia. Booth in Gas Section. Exhibiting: Valves, burners, blow torches, soldering irons and air and gas-mixing machines and compressors. Representative: F. Hess.

SHAKEPROOF LOCK WASHER CO., Chicago. Booth 10-L. See: Illinois Tool Works.

SHELL PETROLEUM CORP., St. Louis. Booth 10-F. Exhibiting: A working display in which samples of various steels will be pickled for different lengths of time; samples of several S.A.E. grades of steel and other materials. Representatives: W. B. Stevenson, E. G. Richardson, J. L. Manneville, C. C. Crane, D. P. Summers and E. P. Kastien.

SHORE INSTRUMENT & MFG. CO., Jamaica, N. Y. Booth 14-D. Exhibiting: Scleroscopes; durometers elastometers (rubber testing instruments); and hardening compounds.

SOUTHERN MANGANESE STEEL, division of American Manganese Steel Co., St. Louis. Booth 28. Exhibiting: Heat and corrosion-resisting castings and the raw materials from which they are made. Representatives: A. W. Daniels, R. J. Williams, and E. F. Mitchell.

SOUTHWARK FOUNDRY & MACHINE CO., Philadelphia. Booth 41-B.

SPENCER TURBINE CO., Hartford, Conn., Booth 75. Exhibiting: Turbo compressors; foundry cupolas; a 15-horsepower machine for delivering air to any furnace in operation at the show; and a 5-horsepower machine with casing and end heads made of stainless steel and impellers of durlamin for handling injurious gase and acid fumes. Representatives: A. W. Peard, F. A. Wright and R. A. Brackett.

STANDARD ALLOY CO. INC., Cleveland. Booth 30-D. Exhibiting:

Convention Daily To Appear Sixth Time

FOR the sixth consecutive year, the Penton Publishing Co. will issue a special STEEL TREATERS' DAILY during the National Metal congress. This daily newspaper, sponsored by STEEL and DAILY METAL TRADE, will appear on Tues ay, Wednesday, Thursday and Friday mornings. Each issue will contain complete programs and reports of the convention sessions, descriptions of the National Metal exposition, and biographical sketches of prominent members of the American Society for Steel Treating, American Welding society, the Institute of Metals and Iron and Steel divisions of the American Institute of Mining and Metallurgical Engineers, and the Iron and Steel and Machine Shop Practice divisions of the American Society of Mechanical Engineers. A wealth of news of general interest also will be presented. Complimentary distribution of copies of STEEL TREATERS' DAILY will be made at the Stevens hotel and Congress hotel. In addition, arrangements have been completed to mail copies for all four days to all members of the American Society for Steel Treating and American Welding society, thus carrying to those absent all the news while it is still news. Extra copies can be obtained at the headquarters of STEEL and DAILY METAL TRADE in Booth 25-D.

Alloy beams rails and miscellaneous parts for normalizing and pack and pair furnaces; roller-hearth disks and spacers; insulated shaft assembly for normalizers; enameling burning racks; chain grate castings for heat resisting service; furnace trays and shoes; roller rails; skid rails and shoes; pump casings and impellers; furnace parts and miscellaneous heat and acid-resisting castings covering the heat treating and chemical field; and return bends, elbows and fittings used in the oil industry. Representatives: Harvey M. Smith, Frank F. Jackson, Emerson M. Williams, W. D. Mann, George S. McFarland, A. D. Darragh, William M. Titzel and Wharton L. Peters.

STEEL, Cleveland. Booth 25-D. Exhibiting: Copies of STEEL, *Daily Metal Trade, The Foundry, Abrasive Industry, Machine Design, Automotive Abstracts* and other periodicals of the Penton Publishing Co.; also technical books. The space will be fitted up as a rest room and all who attend the exposition are cordially invited to make their headquarters here. Representatives: C. J. Stark, J. D. Pease, E. L. Shaner, G. O. Hays, John Henry, L. C. Pelott, C. A. Wardley, E. F. Ross, J. D. Knox, A. H. Allen, F. B. Pletcher and Guy Hubbard.

STEEL CITY TESTING LABORATORY, Detroit. Booth 41-B. Exhibiting: Power-operated brinell testing machine; sheet metal testing machine; hardness testing hammer; electromagnetic crack detector; and a standard hand-operated brinell testing machine.

STOODY CO., Whittier, Calif. Booth 103. Exhibiting: Photographic and actual sample display of welded-on overlays made from alloy welding rods. Representatives: Miles C. Smith, J. C. Blake, C. E. Phillips and C. P. Konton.

STRONG, CARLISLE & HAMMOND CO., Cleveland. Booth 34. Exhibiting: Heavy-duty high speed steel hardening furnace; Turbocompressor; furnace photographs; and a number of small furnace parts and circulars and catalogs. Representatives: R. P. Bethke, A. B. Lindsay, Jacob Weintz, F. C. Parsons, Charles Klaue, Fred Leopold and G. S. Peterson.

D. A. STUART & CO. LTD., Chicago. Booth 4-D. Exhibiting: Metal-working oil products and lubricating specialties. Representatives: C. I. Grierson, T. B. Langdon, W. H. Oldacre, W. H. Huelster, C. H. Baker, B. W. Deacon, G. A. Dudley, A. S. Hull and A. J. McDuff.

SURFACE COMBUSTION CO., Toledo, O. Booth in Gas Section.

T

TAYLOR-WINFIELD CORP., Warren, O. Booth 94. Exhibiting: Butt and spot-welding machines. Representatives: J. A. Anderson, W. A. Anderson, George E. King, C. T. Marsh, C. A. Gould and C. G. Bassler.

THOMSON-GIBB ELECTRIC WELDING CO., Lynn, Mass. and Bay City, Mich. Booth 97. Exhibiting: Heavy-duty, air-operated, 2-roll seam-welding machine; spot-welding machines; samples of welded products. Representatives: W. H. Gibb, C. E. Shearer, C. O. Watson, R. B. Strout, R. L. Browne, A. E. Hackett, D. A. Clements, P. B. Hall, C. K. Stone and G. K. McMullen.

TIMKEN STEEL & TUBE CO., Canton, O. Booth 1-D. Exhibiting: Various sizes of bars and shapes and an assortment of seamless tubing. Representatives: M. T. Lothrop, J. W. Spray, A. J. Sanford, E. F. Talmadge, Robert Atkinson, S. D. Williams and W. G. Hildorf.

HAROLD E. TRENT CO., Philadelphia. Booth 36.

U

UNA WELDING & BONDING CO., Cleveland. Booth 105. Exhibiting: Welding machines including single and double, semiautomatic and full-automatic units; and welding rods. Representatives: E. W. Kronbach, A. A. Probeck, L. R. Kerkeley, L. S. Burgett and J. B. Austin.

V

VANADIUM-ALLOYS STEEL CO., Latrobe, Pa. Booth 24-B. Exhibiting: Fractures and samples of high-speed, carbon and alloy steels and tungsten-carbide tools. Representatives: R. C. McKenna, F. Rose, L. D. Bowman, J. P. Gill, R. B. George, R. R. Artz and C. V. Reilly.

VANADIUM CORP. of America, New York. Booth 9-F. Exhibiting: Ferrovanadium, ferrochromium, ferrosilicon, ferrotitanium, alsifier, and specimens of vanadium steel applications. Representatives: B. D. Saklatwalla, G. L. Norris, H. T. Chandler, Jerome Strauss, J. A. Miller, C. B. Woodworth, Walter Smith, C. N. Dawe, T. Bourke and A. W. Demmler.

VULCAN CRUCIBLE STEEL CO., Aliquippa, Pa. Booth 10-B. Exhibiting: High-speed, alloy and carbon tool steels and special steels. Representatives: S. G. Stafford, R. M. Kelso, A. D. Beeken Jo., S. B. Minton, E. H. Lurker, O. H. Beall and E. V. Hobson.

W

WEAVER BROS. CO., Adrian, Mich. Booth 29-B. Exhibiting: Pickling equipment showing application of methods to control temperature and acid concentration of solutions. Representatives: J. C. Weaver, D. E. Stamm and H. E. Rose.

WEDGE LOCK TOOL CO., Chicago. Booth 10-L. See: Illinois Tool Works.

WHEELING MOLD & FOUNDRY CO., Wheeling, W. Va. Booth 61.

WHEELOCK, LOVEJOY & CO. INC., Cambridge, Mass. Booth 8-D. Exhibiting: Replicas of warehouses, heat-treating and forging plants; special allo~ steel parts. Representatives: A. O. Fulton, F. H. Lovejoy, S. W. Parker, A. R. Townsend, F. J. DeVan and H. A. Bischoff.

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa. Booth 76. Exhibiting: Portable welding units; automatic seam welder; welding electrodes; and views of electric furnace installations. Representatives: W. W. Reddie, W. C. Pearson, G. H. Koch, T. C. Kelley, C. W. Babcock, H. C. Bostwick, J. W. Allison, J. F. Baker, T. J. James, W. C. Stevens, J. Mixsell, J. H. Germany, M. S. Boreen, J. C. Woodson, C. H. Carpenter, R. H. Allen, W. Roth, O. A. Colby and F. Kerin.

WHITMAN & BARNES INC., Detroit. Booth 4. Exhibiting: Drills for drilling 11 to 13 per cent manganese steel and interchangeable punches and retainers. Representatives: E. D. Wolf, R. O. McGraw, F. T. Harrington, W. R. Breeler, M. J. Kearins and H. D. Strelluf.

WICKWIRE SPENCER STEEL CO., New York. Booth 74. Exhibiting: A spirally-woven conveyor belt for heat-treating furnaces, quench tanks, etc.; miscellaneous springs; and a machine for demonstrating the resistance to fatigue of valve spring wire. Representatives: M. G. Werme, O. C. Ploss, V. C. King, E. F. Early, R. R. Tatnall, F. J. Connor, J. R. Worsfold, F. W. Hale, C. R. Coffeen and M. A. Bloomquist.

Y

YOUNG BROS. CO., Detroit. Booth in Gas Section. Exhibiting: A direct gas heated oven with automatic control and equipped with internal recirculating system; a truck-type oven with a combination of direct, indirect and remote gas heat; and various controls and safety appliances. Representatives: R. B. Reed, C. G. Lisch, V. A. Fox and T. P. McVicker.

Z

ZIV STEEL & WIRE CO., Chicago. Booth 17-B. Exhibiting: Tools, cutlery, dies and specimens of fabrications. Representatives: G. F. Ziv, F. A. Lawler, N. J. Hyslip, H. E. Ziv, A. F. Brunck, J. D. Hall, C. A. Mulligan, C. A. Hintz, P. S. Seck, E. J. LaCroix and R. J. Foley.

Chicago's Municipal Pier on which the 1926 National Metal exposition was held

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

HARTFORD, CONN. — Pratt & Whitney Aircraft Corp., 450 Capitol avenue, and Chance Vought Corp., 120 Broadway, New York, will build two hangars at United airport at a cost of over $40,000. Austin Co., 120 Broadway, New York, is engineer.

NEW LONDON, CONN.—U. S. Coast Guard academy plans to build a group of buildings here at a total cost of $1,750,000, on Mohegan avenue. A power plant is included in the plans, which are private.

NEWTOWN, CONN.—Fairfield state hospital commission, capital building, Hartford, Conn., has awarded contract to Abbadessa & Bros. Inc., 159 Winthrop avenue, New Haven, Conn., for a group of buildings near here. Shops and power house are included in the plans, which call for the expenditure of about $1,750,000.

STAMFORD, CONN.—Stamford Gas & Electric Co. will build a 3-story 80 x 112-foot warehouse and a 63 x 194-foot garage at Crosby and Pacific streets. Contract has been awarded to Turner Construction Co., 178 Tremont street, Boston.

BEVERLY, MASS.—Gulf Refining Co., Park Square building, Boston, proposes to build a 1-story pump house addition here, on Water street. Plans are private. Cost is estimated at about $40,000.

BOSTON—Bethlehem Shipbuilding Corp., 100 Milk street, has awarded contract for a 2-story warehouse, 100 x 200 feet. Cost is estimated at $40,000.

BOSTON — R.C.A. Victor Co. of Massachusetts, 76 Atherton street, has awarded contract to Turner Construction Co., 178 Tremont street, for alterations to its 4-story, 60 x 242-foot plant.

BOSTON—Quincy Market, Cold Storage & Warehouse Co., 178 Atlantic avenue, has awarded contract to Aberthaw Co., 80 Federal street, for a power house, 70 x 77 feet, to be erected at a cost of about $100,000.

DIGHTON, MASS.—Anchor Color & Gum Works is taking bids for the construction of a 1-story power unit, to be erected at a cost of about $40,000. E. I. Marvell, 290 Bedford street, Fall River, Mass., is architect.

FITCHBURG, MASS. — Fitchburg Electric Appliance Co. has been incorporated with 500 no par shares by Evans W. Morgan and Louis B. Smith.

New York

ALBANY—O. F. Warhus, 38 Edgwood avenue, is reported to be organizing a company for the manufacture of motor buses.

BROOKLYN—Natural Seal Co., Fourteenth avenue and Thirty-sixth street, recently suffered loss by fire to its plant. Company manufactures metal caps.

BROOKLYN—Plants of Kason Hardware Corp., manufacturer of hardware specialties, and Majestic Metal Spinning & Stamping Co., manufacturer of electrical fixtures, both at 61 Navy street, recently were damaged by fire.

BUFFALO—City, G. F. Fisk commissioner of public works, municipal building, has closed bids for construction of hangar and administration buildings at Marine airport.

BUFFALO — Plant of Buffalo Foundry & Machine Co., 1543 Filmore avenue, manufacturer of automotive castings and products, recently was severely damaged by fire. Damage is estimated at about $40,000. J. A. Gauther is president.

LOCKPORT — Cocker Mfg. Co., whose incorporation recently was noted, advises through Frank V. Oldham, president, that the incorporation is to provide for future expansion and addition of employes and machinery. (Noted Aug. 28.)

MITCHELL FIELD—Fire recently damaged a boiler house and warehouse unit here. Approximate loss, $300,000.

NEWARK—Shop building is to be erected here at the Newark state school by the department of mental hygiene, capital building, Albany, N. Y. Cost is estimated at $25,000.

NEW YORK—Artistic Wire Forming Co. Inc., 416 Broome street, recently suffered damage by fire to its plant. Company manufactures wire and metal products.

NEW YORK—Ever-Guard Corp. has been incorporated with 100 common shares by Gettinger & Gettinger, 1501 Broadway, to deal in safety alarm strong boxes.

SYRACUSE — Schultz Appliance Corp. has been incorporated with $50,000 and 300 common shares by Adcock & Longley, to deal in furnaces.

Resale News

Standard Pneumatic Action Co., New York, will sell machinery and equipment, under the auspices of Samuel T. Freeman & Co., auctioneers, at 638 West Fifty-second street, New York, on Sept. 16. Sale comprises woodworking, metal and metalworking machinery, nickel and brass plating equipment and office equipment. Machine tools to be sold include automatic screw machines, lathes, presses, millers and drills.

Pennsylvania

MCKEESPORT—Fort Pitt Steel Casting Co., Houston avenue, will build a 2-story warehouse addition, 31 x 68 feet. Contract has been awarded to Blair & Mack, 920 Market street.

NEW ALEXANDRIA—Charles B. Carroll has secured a site along the William Penn highway, near here, for an airport. Development will include 65 acres.

PHILADELPHIA—Ebert Motor Truck Co. Inc., Twenty-fourth and Brown streets, has acquired a 7-story plant at the corner of Eleventh and Oxford streets, for expansion.

PHILADELPHIA — Herman H. Schmidt, manufacturer of hardware and house furnishings, 4510 Lancaster avenue, is building a 3-story and tower addition. Contract is held by Rumpf & Kohlmeyer, 3543 Germantown avenue.

PITTSBURGH—Brinker Supply Co., Clark building, manufacturer of contractors' machinery, will build a 1-story workshop, 30 x 70 feet, on Hamilton avenue.

PITTSBURGH—Baltimore & Ohio railroad, H. H. Harsh division engineer, Baltimore & Ohio building, has awarded contract to Ellington Miller Co., 25 East Jackson boulevard, Chicago, for a 2-story 45 x 603-foot warehouse, a 2-story, 45 x 80-foot warehouse, and a 200-foot loading platform. Total cost is estimated at $150,000.

PITTSBURGH—A. L. Rabberman advises that contract has been awarded to Frank J. Busse Co., 35 Wabash avenue, for the construction of the 50 x 100-foot building recently noted as proposed for erection at 1201 Chartiers avenue. Second floor of the structure will be used for offices and machine shop. Property consists of 1¼ acres, to be used for storage and future building. (Noted Aug. 21.)

READING—Gray Iron Foundry & Mfg. Co. has been incorporated with $25,000 capital by Samuel J. Wagner, 328 North Sixth street, to manufacture and deal in castings, machine products, mechanical devices, machinery parts, appliances and accessories.

WILKES-BARRE—Radiator Hanger Corp. has been incorporated with $5000 capital by B. L. Frey, 360 Warren avenue, Kingston, Pa., to manufacture and deal in heating and plumbing supplies.

New Jersey

CAPE MAY—Capt. Anton Heinen is reported to have begun operations here for the manufacture of small dirigibles for private use, having leased a hangar at the naval air station, adjoining the coast guard base.

ENGLEWOOD — Peteler Power Door Inc. has been incorporated with

2500 common shares by Delmar & Ferry, attorneys, to deal in electrical appliances.

JERSEY CITY—Savoye Pewter Toy Mfg. Co. Inc. has been incorporated with $100,000 capital by Anna E. Perle, attorney, 591 Summit avenue, to manufacture toys.

KEYPORT—Nagel Aircraft Corp., whose incorporation recently was noted, advises through Dr. Felix Nagel, 123 First street, that an all-metal plane designed by himself will be manufactured after preliminary plans are worked out. After tests, the company plans to build or lease a plant next year. (Noted Aug. 28.)

NEWARK—North Ward Radio Co., 360 Plane street, has plans for a storage unit to be erected at a cost about $85,000.

NEWARK—Industrial Terminal Co., 50 Church street, New York, associated with the Erie railroad, will install elevating, conveying, electric power and other equipment in the proposed new 8-story freight terminal to be erected at Ogden and Gouveneur streets. Cost of the entire project will approximate $1,500,000. The company's engineering department is in charge of the construction.

PATERSON—Public Service Electric & Gas Co., Roseland, N. J., proposes to build a substation here at a cost of about $60,000. Plans have been filed.

Ohio

CINCINNATI—Boye & Emmes Machine Tool Co., 2245 Spring Grove avenue, manufacturer of lathes, recently noted as seeking a new plant site, has awarded contract to Austin Co., Cleveland, for the design and construction of a new plant on Caldwell drive, Hartwell. New unit will be 1-story, 120 x 260 feet, and will cost about $75,000. Contract includes installation of a 6-ton bridge crane. Completion date has been set for Nov. 1. (Noted July 24.)

CLEVELAND — General Electric Co. has purchased an industrial tract of 23 acres near Chardon road, and plans are being prepared for the erection of the first unit, which will be one and two stories, 320 x 370 feet. Divison making wire for lamps will be moved to the new unit. A 3-story warehouse costing $750,000 is now being erected for the company by Sam W. Emerson Co., 1836 Euclid avenue, near Woodland avenue and East Fifty-fifth street.

DAYTON—Duberstein Iron & Metal Co., 953 Washington street, has awarded contract to Charles Duibley for a warehouse addition. Estimated cost, $2000.

TOLEDO—Toledo Saw & Grinding Co., whose incorporation recently was noted, has obtained manufacturing space at 2716 Monroe street, and will engage in the manufacture of saws and grinding of knives. Adelbert Hendricks is president. (Noted Aug. 28.)

WORTHINGTON — Contract for erection of a shop building to be built for Worthington high school has been awarded to Schuster Bros., Bethel, O.

Indiana

ANDERSON—Powercraft Motors Corp., which recently acquired the Anderson Carriage Works, will remodel the plant and install equipment for the manufacture of motors, engines, power craft and accessories. Approximate cost, $60,000.

EVANSVILLE—Board of commissioners will receive bids until Oct. 1 for a new power plant and two steam boilers for the county infirmary. Total expenditure for improvements will amount to about $150,000. A. E. Neucks is architect.

Michigan

DETROIT—Maise Corp. has been organized with Herman C. Maise as its head, to manufacture an oil burner for home use. Production has been started at 1651 Grand boulevard east.

DETROIT—University of Detroit, Six Mile road and Livernois avenue, proposes to erect a 4-story high school building, for which a power plant, boilers and other equipment will be needed. Cost is estimated at $650,000.

DETROIT—M. & G. Machine Works Inc., 487 West Alexandria avenue, has been incorporated with $3000 capital by David Boyer to manufacture the Lally light and power plant.

DETROIT—Arrow Steel Corp., 812 Fisher building, has been incorporated with 40,000 no par shares by S. Walter Sorenson to deal in steel and steel products.

DETROIT — Power Carburetor Corp., 4856 Cass avenue, advises through Harry N. Miller, secretary-treasurer, that the company has been organized to manufacture a gasoline carburetor developed by John B. Drahonovsky, who is president of the new company. Initial production will be started soon in a plant leased at the present address. (Noted Aug. 28.)

HOUGHTON—Carroll Steel Foundry Co. has under consideration plans for a plant addition, at present tentative. Construction may be started next spring. James R. Carroll is president and general manager.

Illinois

CHICAGO—Continental Type Founders of Chicago Inc., 608 South Dearborn street, has been incorporated with 1000 no par shares by Corporation Trust Co., 112 West Adams street.

CHICAGO—Illinois Steel Co., South Chicago, Ill., has a building permit for construction of a 1-story plant at the rear of 8345 Mackinaw street. Estimated cost, $1,500,000. L. C. B. Holmboe, South Chicago, Ill., is architect.

CHICAGO—B. B. Burner Corp., 2023 South Western avenue, has been incorporated with $10,000 and 1500 no par shares by Harry A. Biossat, 77 West Washington street, to deal in oil burners and fuel savers.

CHICAGO—Chicago Rapid Transit Co., 72 West Adams street, is building a second car repair unit at its shops at Niles Center at a cost of about $375,000. Structure will be 200 x 252 feet. Eight additional units will be built later.

CHICAGO—Guthier Airplane Co., 33 South Market street, has been incorporated with $40,000 capital by Schuyler, Weinfeld & Parker, Continental Illinois Bank building, to manufacture and deal in airplanes, machines and flying apparatus.

CHICAGO—Fire at 255-329 East Illinois street recently caused considerable damage to the property of Chris-Craft Motor Boats Co., 29 East Wacker drive.

CHICAGO—A. Finkl & Sons Co., 1326 Cortland street, manufacturer of steam forgings, has acquired a plant on Southport avenue, adjoining its present plant, formerly occupied by T. A. Cummings Foundry Co. Unit will be used for future expansion, and is of two stories, 150 x 150 feet.

CHICAGO—Pressed Steel Car Co., Farmers Bank building, Pittsburgh, local address 122 South Michigan avenue, is adding a power unit to its Hegewisch plant here and is contemplating additions to its steel foundries. F. N. Hoffstot is president of the company.

DECATUR— Wabash railway, M. F. Longwill chief engineer, Railway Exchange building, St. Louis, has awarded contract for a roundhouse addition here to Jerome A. Moss Inc., 80 East Jackson boulevard, Chicago.

GALESBURG—Chicago, Burlington & Quincy railroad, 547 Jackson boulevard, Chicago, has awarded contract to Roberts & Schaefer Co., 400 North Michigan avenue, Chicago, for an electric cinder plant in its yards here. A. W. Newton is chief engineer of the railroad.

QUINCY—Board of education, recently noted as planning a machine shop in connection with a trades school, will receive bids about Oct. 1 for the construction of the school and shop, at Fourteenth street between Main and Jersey streets. Cost is estimated at about $1,300,000. J. D. Chubb, 109 North Dearborn street, Chicago, is architect. W. E. White, Musselman building, Quincy, is secretary of the board. (Noted May 15.)

Missouri

ST .LOUIS—Phil DeC. Ball, Security building, who recently purchased the plant of Ryan Aircraft Corp., is reported to be making plans for organization of a company to manufacture planes.

ST. LOUIS—Illinois Terminal railroad, E. S. Hight chief engineer, Shell building, will erect a 20-story terminal, warehouse and office building at a cost of about $5,000,000. Mauran, Russel & Crowell, Chemical building, are preparing plans. Struc-

ture is to be located at Lucas avenue, Twelfth, High and Morgan streets.

Arkansas

HELENA—Allin Machine Works, Pontotoc street and Missouri Pacific railroad, advises through Richard Allin that rebuilding of the plant, recently noted as damaged by fire, will be completed soon. Unit is being lengthened to accommodate the blacksmith shop and gas welding shop. Immediate needs consist of hand tools, twist drill, milling cutters and a complete welding outfit except generator. (Noted Sept. 4.)

LITTLE ROCK—Missouri Pacific Transportation Co., Arcade building, will increase its shop facilities by construction of a plant addition.

MARIANNA—Chamber of commerce proposes to lay out an airport. Cost is estimated at about $25,000.

ROGERS—William Gilbert, Ada, Okla., may move his plant here and establish Rogers Iron Works on West Walnut street.

Oklahoma

BEAVER—Oklahoma Electric & Water Co. will enlarge its power plant here and make improvements to its distribution system.

CLINTON—Chamber of commerce plans to build a hangar unit at the new airport, recently noted as having been approved by city council. (Noted Aug. 7.)

MUSKOGEE—City is having plans prepared by E. Brock for a light plant. Approximate cost, $75,000.

OKLAHOMA CITY—William Bleakly and Clint Johnson, municipal airport, have acquired Tibbs Flying Service and will add new equipment.

OKLAHOMA CITY—American Iron & Metal Co. has been incorporated with $10,000 capital by W. J. Edwards, 800 East Main street, to deal in old metals.

PICHER—DeMier-King Mining Co. has been organized by C. C. King and B. W. DeMier to engage in lead and zinc mining operations.

WOODWARD—City is having plans prepared for a municipal light plant. H. M. Renner is engineer. Cost is estimated at $125,000.

Texas

BAYTOWN—Humble Oil & Refining Co., Humble building, Houston, Tex., has awarded contract for the construction of a 1-story, 173 x 420-foot warehouse, to be built at a cost of about $225,000.

DALLAS—Southern Air Transport Inc., Love field, contemplates construction of a combination hangar and office building, to include repair shop. Estimated cost, $100,000.

DALLAS—Superior Lead Co. has been incorporated with $5000 capital by Donald H. Murphy, 1039 North Edgefield street, to manufacture lead products.

HOUSTON—Hughes Tool Co. has awarded contract to Southwestern Construction Co., West building, for a 2-story warehouse unit, 280 x 323 feet and another 120 x 301 feet. Cost is estimated at $250,000.

SAN ANTONIO—Capt. C. W. Ocker and Lieut. Carl J. Crane are reported to be negotiating with manufacturers for the production of a new aeronautical instrument, a flight integrator.

TEXLINE—West Texas Utilities Co., Abilene, Tex., which recently acquired the light and water plant here, plans to install additional pumping equipment.

Wisconsin

BALDWIN—Western Cable & Light Co., manufacturer of batteries and electric supplies, plans to build a new plant at a cost of $50,000. Work is to begin at once. Arthur Lee, Hudson, Wis., is architect.

MILWAUKEE—Moise Steel Co., 447 Virginia avenue, has awarded contract to Bentley Bros. Inc., 808 South Pierce street, for a 1-story, 73 x 225-foot plant to be erected on Thirty-fifth avenue.

RANDOLPH—City will receive bids until Sept. 19, through D. B. Davis, clerk, for a pumping station and equipment, to include one 300-gallons per minute, engine-driven centrifugal pump; one single-stage 110-foot compressor; one 6-inch turbine water meter; pipe, valves and fittings. W. G. Kirchoffer, Madison, Wis., is consulting engineer in charge of the project.

STEVENS POINT—Meronek Bros., manufacturers of potato planting machines and garage door mechanisms, are considering erection of a new plant on Martha's Lane, between Rice and Bush streets.

Iowa

DECORAH—Tatro Bros. Inc., recently noted as leasing a plant here, advises through J. A. Nelson, secretary, that the company has sufficient equipment for present needs but expects to be in the market for items of equipment and machinery soon. Company manufacturers a special 32-volt farm light plant radio receiver. (Noted Sept. 4.)

HUMBOLDT—City council plans to establish a municipal airport. Location of site is pending.

Nebraska

HASTINGS—Union Pacific railroad, H. C. Mann chief engineer, 1416 Dodge street, Omaha, Nebr., has awarded contract to Roberts & Schaefer, 400 North Michigan avenue, Chicago, for an electric cinder plant here.

Southern States

BIRMINGHAM, ALA.—Shell Petroleum Corp., Woodward building, has awarded contract for a unit at Twenty-eighth street and North Ninth avenue, to S. S. Jacobs, Hildebrandt building, Jacksonville, Fla. Garage, repair shop and tanks are included in the plans. Estimated cost, about $70,000.

SAYRE, ALA.—Gulf States Steel Co., Brown-Marx building, Birmingham, Ala., is receiving bids for the construction of a 1-story plant addition for mechanical service. Structure will be 77 x 117 feet and will cost $85,000.

ATLANTA, GA.—Atlanta Metallic Casket Co., 216 Elliott street northwest, has awarded contract to Flagler Co., Red Rock building, for a warehouse unit, 44 by 114 feet.

COVINGTON, KY. — Michael Art Bronze Co., 231 Court avenue, will remodel its plant at a cost of about $900. B. T. Wisenall, Union Central building, has the contract.

NEW ORLEANS — New Orleans Public Service Co., 317 Baronne street, as a part of the $1,000,000 improvement program recently noted, plans to build mechanical shops at a cost of about $70,000. (Noted June 12.)

BRICKTON, N. C.—Blue Ridge Aircraft Inc. has been incorporated with $50,000 capital by W. A. Marsh, Fairview, N. C., to deal in aircraft.

SPARTANBURG, S. C.—Silver-X-Bearing & Supply Co., Newberry, S. C., may move its plant to a location at 155 South Liberty street, here.

COPPER HILL, TENN.—Tennessee Copper Co., 61 Broadway, New York, has awarded contracts for the construction of a machine shop here.

MEMPHIS, TENN.—City plans municipal water pumping station and improvements to the water system, to be built at a total cost of $2,000,000.

LURAY, VA.—Republic Service Corp., Coatesville, Pa., is reported to be planning a hydroelectric power plant near Overall, Va., about twelve miles from here, on the Shenandoah river. Total estimated cost, about $1,000,000.

Pacific Coast

DANA POINT, CALIF.—E. W. Calder, Wilshire building, Los Angeles, proposes to build a combination hangar, administration building and school here at a cost of about $75,000. S. H. Woodruff, Wilshire building, Los Angeles, is preparing plans.

LOS ANGELES—Consolidated Steel Corp., 1200 North Main street, recently noted as having suffered fire loss to a warehouse, and as planning new plant construction, is reported to be planning a plant center in the Maywood section, consisting of ten units. Total cost is estimated at $1,000,000. (Noted Aug. 28.)

PASADENA, CALIF.—California In-

stitute of Technology, 1201 East California street, proposes to build a 2-story laboratory. Plans are being prepared by Goodhue & Associates, 2 West Forty-seventh street, New York. Estimated cost, $800,000.

SAN FRANCISCO—City will receive new bids for 16 deep-well turbines for water improvements. Previous bids were rejected.

SAN FRANCISCO—Truscon Steel Co., Youngstown, O., local office in the Call building, proposes to build a 1-story plant at Carroll and Newhall streets at a cost of about $50,000. A crane will be installed. Plans are private.

SAN FRANCISCO—Royal Show Case Co., 759 McAllister street, has awarded contract to Spivock & Spivock, Hobart building, for a 2-story shop and plant building. Estimated cost, $50,000.

SOUTH SAN FRANCISCO, CALIF.—Pacific Coast Steel Co., 111 Sutter street, San Francisco, is having plans prepared for a plant for the manufacture of plates. Plans are private. Cost is estimated at $60,000.

HOOD RIVER, OREG.—City council has approved plans by Stevens & Koon, Portland, Oreg., consulting engineers, for a hydroelectric power plant to cost $53,000.

SALEM, OREG.—California-Oregon Power Co., 454 California street, San Francisco, will develop six power sites on the Klamath river, at a total eventual cost of $27,600,000. R. Luper, Salem, is engineer.

SEATTLE — Greene Electric Furnace Co. has been incorporated with $10,000 capital by A. E. and G. E. Greene.

TACOMA, WASH.—Tacoma Steel & Equipment Co. will erect a new unit, 75 x 100 feet, at Broadway and Commerce streets.

Dominion of Canada

VANCOUVER, B. C. — Canadian Sumner Iron Works Ltd., 560 Vernon drive, proposes to build a machine shop, 1-story, 104 x 240 feet, to cost $30,000.

LONDON, ONT.—Barrett Motors Ltd. has been incorporated with $36,000 and 4000 no par shares by Francis L. Barrett, 92 Elmwood avenue, to manufacture and deal in automobiles, motors, engines and machines.

ORILLIA, ONT.—Newton Croxall Ltd. has been incorporated with $75,000 capital by Clarence R. Long and Francis Smith, to manufacture and deal in stoves, ranges and electrical appliances.

TORONTO, ONT.—Selvig Fibre Machines Ltd. has been incorporated by Robert Forsyth, 45 Richmond street west, to manufacture and deal in machinery, devices and apparatus for treating fibrous materials.

TORONTO, ONT.—Barometric Fuel Saver of Canada Ltd. has been incorporated with $40,000 and 3000 no par shares by Austin A. Forhan, 244 Bay street, to manufacture and deal in draft controls, fuel savers, furnaces, stoves and boilers.

TORONTO, ONT.—Canadian Pacific railway, Windsor street station, Montreal, Que., will construct eight units near Fleet and John streets here, to be used in connection with the company's work on a large viaduct. A repair shop is included. Cost of all units ,about $500,000.

WINDSOR, ONT.—Superior Chain & Plating Co. Ltd. has been incorporated with $40,000 and 10,000 no par shares by David W. Booth, Walkerville, Ont., and John Garrick, Flint, Mich., to carry on the business of brass and iron founder and engineer.

BUCKINGHAM, QUE.—James McLaren Co. Ltd. has applied for a permit to develop a hydroelectric project on the Lieore river near here. Total cost of the project is about $10,000,000. Private plans include installation of four 28,000-horsepower generators and four 30,000-horsepower waterwheels.

New Trade Publications

PORTABLE ELECTRIC TOOLS — Chicago Penumatic Tool Co., New York, in a current bulletin illustrates some additions to its line of portable electric tools, drills, screw drivers and die grinders. The tools are illustrated and tables of specifications are given.

ARBORS — Kearney & Trecker Corp., Milwaukee, has issued a catalog on its arbors, including a pictorial presentation of the method of their manufacture. Tables of data accompany illustrations of the various arbors and accessories as an aid in ordering appropriate sizes.

V-BELT DRIVE—Medart Co., St. Louis, has published a bulletin covering its V-belt drive. It describes the development and application of this form of drive and discusses the subject of efficient power transmission. Data tables and price lists are given.

LUBRICATION—Low viscosity lubrication is discussed in the current issue of the Texas Co.'s publication on lubrication. It treats of the relation of its economy in power consumption. It discusses the subject as applied to street railways, textile machinery, turbine bearings, the ceramic industry and general machinery.

BOILERS—James T. Castle, merchant engineer, Pittsburgh, is distributing a bulletin of the Union Iron Works, Erie, Pa., describing its type of boilers designed for limited space conditions and combining dry steam, unrestricted circulation, high efficiency and reliability. Diagrams and tables of data complete the description of the boilers.

GRINDER—A new portable grinder for mass production has been added to its line by the Dumore Co., Racine, Wis. It is more powerful than other members of the grinder group of this company and is designed for great accuracy. A bulletin has been issued giving full description and specifications and numerous diagrams and illustrations to show application and construction.

INDUSTRIAL OVENS — Gehnrich Oven Co. Inc., Long Island City, N. Y., has prepared a looseleaf catalog and binder containing bulletins on various ovens and accessories and on baked finishes and electric insulating materials. They are illustrated to show types of equipment and typical installations. The bulletins cover the subject of industrial ovens and baking as applied to modern requirements, with discussion of ventilation, conveying and other factors.

MOLYBDENUM—Climax Molybdenum Co., New York, meeting success with its publication on molybdenum in 1928, has compiled a similar publication covering this metal and its development in 1929. It is compiled from data published in various media and is as free as possible from bias. It covers the use of this metal in nitriding, in acid-resisting alloys and steels, gray iron castings, alloy steel castings, aircraft and automobiles and gives miscellaneous applications.

TRUCK-TYPE SWITCHGEAR — Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has issued a catalog on its metal enclosed truck-type switchgear, manually and electrically operated, built for three-phase, 60-cycle supply, 3000 amperes maximum and 15,000 watts maximum. All high-voltage circuits are enclosed, affording safety to the operator. Illustrations include halftones and diagrams and a table is given of interrupting capacities and dimensions.

WELDING — A book of the arc welding of structural steel has been published by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. It covers progress in this method of construction and covers the strength of welded joints, design data, test and inspection data, building code, estimating cost and bridge specifications. It contains many illustrations, a review of progress and discussion of future and possible developments in welding.